AMERICAN ANTIQUITY

1
795

VOLUME XII
NUMBER 2
OCTOBER 1946

PUBLISHED BY THE SOCIETY
FOR AMERICAN ARCHAEOLOGY

CENTIMETERS INCHES

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AMERICAN ANTIQUITY is printed by the George Banta Publishing Company, 450–454 Ahnaip Street, Menasha, Wisconsin, U.S.A.

Published by the SOCIETY FOR AMERICAN ARCHAEOLOGY, during the months of January, April, July and October. Subscription by membership, annual dues $4.00, includes quarterly issues of AMERICAN ANTIQUITY and other releases, as issued.

Entered as second-class matter July 22, 1935, at the post office at Menasha, Wisconsin, under the Act of March 3, 1879.

Manuscripts and publications for review should be sent to the Editor, Irving Rouse.

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AMERICAN ANTIQUITY

VOL. XII OCTOBER, 1946 No. 2

SOME NOTES ON ROCK SHELTER SITES NEAR HUANCAYO, PERU

HARRY TSCHOPIK, JR.

THE purpose of the present paper[1] is to call attention to certain rock shelter sites in the vicinity of Huancayo, Peru, which—since they have yielded thus far several types of chipped stone artifacts and bone implements, but no pottery—appear at the present writing[2] to be unique in Peru. The two sites described in the following pages are situated on old terraces of the Chupaca River, a tributary of the Mantaro, in Junín Department in the central Peruvian highlands. They were brought to the writer's notice by Mr. Paul G. Ledig, Observer-in-Charge of the Carnegie Institution Magnetic Observatory near Huancayo, who has in the past made small excavations at both sites.

The information which follows is based, not on systematic excavation by the writer, but on small surface collections, on observations made at the sites during several excursions of brief duration, and upon data supplied by Mr. Ledig.

In addition to the two rock shelters described below, caves and shelters were noted in other parts of the Jauja Valley and along the banks of the Mantaro River above and below it at a number of points: (1) in the gorge between La Oroya and the town of Jauja, (2) above the site of the Peruvian Government trout hatchery near Concepción, (3) in the upper Chupaca River gorge to the west of the sites here described, and (4) in the Mantaro River gorge between Huancayo and Izcuchaca (in northern Huancavelica Department). Although these caves were not investigated, they may well contain evidences of former occupation and are mentioned for this reason. It was further noted that artifacts and flakes of flint, silica, and obsidian are scattered widely over Sicaya and Orcotuna pampas (see map, Fig. 10), and on the grounds of the Magnetic Observatory.

THE JAUJA VALLEY

The rock shelters discussed in the present paper are situated in that section of the valley of the Mantaro River which is usually called the Jauja Valley. One of the most favored in the central Peruvian highlands, this valley lies between the Central and Maritime Cordillera of the Andes which here trend from north-northwest to south-southeast. The altitude at the Carnegie Institution Magnetic Observatory, 15 kilometers from Huancayo in a northwesterly direction (see map, Fig. 10), is almost exactly 11,000 feet above sea level.

A few kilometers to the west of the town of Jauja, at the northern end of the valley, the Mantaro River emerges from the confines of the rugged canyon through which it has flowed from the smelter town of La Oroya and, curving to the southeast, flows the length of the Jauja Valley past the city of Huancayo, the departmental capital and railway terminal, at the

[1] The data set out here were collected during the interval between the months of June and December, 1945, while I was engaged in making ethnological studies in the nearby community of Sicaya on behalf of the Institute of Social Anthropology of the Smithsonian Institution. I wish to take this occasion to express my most sincere thanks to Mr. Paul G. Ledig, Observer-in-Charge of the Huancayo Magnetic Observatory of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington. Mr. Ledig not only supplied most of the material described in the following pages, but assisted my investigations in every possible way; in addition, he extended his hospitality to myself and family during the period of the studies at Sicaya.

This paper has had the benefit of many helpful suggestions from Drs. William Duncan Strong and Gordon R. Willey.

[2] Although a lithic culture, presumably nonceramic, has been reported by Barrington Brown from northern Peru, Dr. William Duncan Strong informs me that this complex appears to bear little relationship to that described in the present paper. C. Barrington Brown, "On Stone Implements from North-West Peru," *Man*, Vol. XXVI, No. 64 (London, 1926), pp. 97–101. Unfortunately, this reference is not available to me at the present writing.

southern end. Just to the west of this city the Mantaro is joined by a tributary, the Chupaca River, on the terraces of which the rock shelters are situated (Pl. V, *a*).

The Jauja Valley is roughly elliptical in shape, approximately 55 kilometers long by 20 kilometers wide. It is flanked on either side by rolling, eroded red hills over which, to the east, rise the snow peaks of the Central Cordillera. From these hills the terrain descends in two broad, flat terraces to the present flood plain of the Mantaro River. Surrounding the valley on all sides are the high, barren upland grasslands or *punas* which still abound in game.

Dr. Warren F. Walker, Chief Geologist of the Cerro de Pasco Copper Corporation, has informed the writer that the Jauja Valley is of lacustrine origin and that—probably in late Pleistocene time—its floor was covered by a glacial lake of which Paca lagoon, to the north of the town of Jauja, is a vestige. The terraces into which the rock shelters have been weathered are formed of glacial alluvial materials, probably laid down by glacial rivers. They consist for the most part of incompletely consolidated conglomerate containing sand, gravel, cobbles, and boulders, all of which have been heavily rolled (pl. V, *b*).

The Jauja Valley enjoys a favorable climate in spite of its altitude. That the valley has been important throughout the range of Andean history is indicated by the numerous archaeological remains which are located, for the most part, in the foothills around the valley floor. Today, the entire valley is under intensive cultivation, and there are numerous towns, villages, and scattered farms situated amid groves of eucalyptus trees. Native vegetation is sparse and consists in the main of stunted *quinual* (*Racemosa* sp.) and *quishuar* (*Buddleia incaria*) trees, low shrubs, and grasses. That game was abundant in the region as late as the early

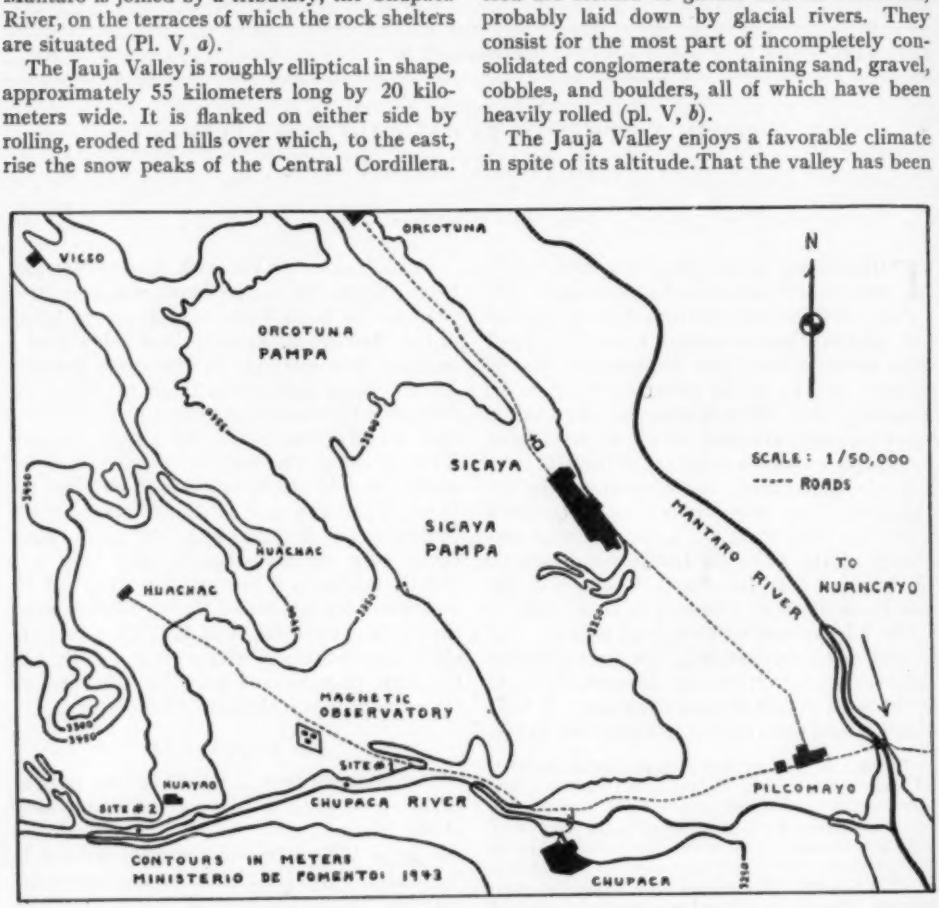

FIG. 10.—Map of lower Chupaca River, showing locations of sites. (After reduction scale is approximately 1/94,000.)

seventeenth century is clear from the following passage from Vásquez de Espinosa, who wrote of the Jauja Valley: "Round about here there are many stray or wild llamas, the guanacos, similar to the llamas, but with a muzzle which is darker colored and more nearly black. . . . There are likewise great numbers of vicuñas, which are another species of those animals. . . ."[3] Today, although it has disappeared from the valley proper, game continues to be abundant in the surrounding hills and *punas;* it consists of herds of vicuña; deer; occasional bear, pumas, and foxes; viscachas (a species of rodent) in great numbers; wild guinea pigs; and Andean geese, ducks, and numerous other water fowl.

THE ROCK SHELTERS

Site No. 1

The rock shelter which has been designated as site No. 1 on the map (Fig. 10) is situated on the left bank of the Chupaca River roughly a kilometer distant in a southeasterly direction from the grounds of the Carnegie Institution Magnetic Observatory. Here the terrain falls away abruptly in a series of three narrow terraces, today sown with small patches of barley, wheat, and maize, to the bed of the river below (Pl. V, *b*). The broad pampa above the rock shelter is under intensive cultivation, and fields of grain extend to the very edge of the cliff. To the west, just above site No. 2, the river emerges from the confines of a steep and narrow canyon to flow almost due east towards its junction with the Mantaro. The bank opposite site No. 1 is dotted with scattered farm houses and fields. Below, to the east, the Chupaca River flows between steep cliffs and is spanned by a shaky pole bridge at Pincha, an outlying *barrio* of the neighboring town of Chupaca.

The place at which site No. 1 is situated is known to the local Quechua-speaking inhabitants of the region as Pachaspata, which means, somewhat inaccurately, "limestone terrace." The rock shelter consists of a shallow cave weathered into the perpendicular face of the third and topmost river terrace. The size of the cave opening is today considerably reduced, owing to the collapse of a greater portion of the roof subsequent to the period when the rock shelter was occupied; this fact has served to protect much of the culture-bearing refuse from the destruction which the remainder of the site has suffered. While it is difficult to estimate the size of the original shelter with any degree of accuracy, it must have measured 14 or 15 meters in width. The present shelter, then, represents approximately a quarter of the original cave. Today the width of the shelter is 3.8 meters, the height of the opening 1.5 meters, while the greatest depth is 2.5 meters. Portions of the collapsed roof vary from 1.5 to 2.0 meters in thickness.

Until systematic excavation is undertaken at the site, it is obviously impossible to estimate the depth of the refuse deposit. Mr. Ledig's excavations within the shelter proper did not exceed one meter in depth, and culture-bearing refuse continued below this level. If one may judge from the general configuration of the terrace on either side of the shelter, the depth of rubbish deposit appears to be at least two meters at the cave opening. Weathering has revealed refuse and ash all along the edge of the collapsed roof, and these deposits extend down the steep slope below the mouth of the shelter for a distance of 50 meters. At this point a path which climbs the slope has cut through the refuse stratum, showing its thickness to be from 30 to 50 centimeters. In addition, artifacts and flakes are scattered widely along the terrace rim above the shelter for a distance of at least a hundred meters in all directions.

The earliest digging in site No. 1 appears to have been done within the past twenty or thirty years by residents of the town of Chupaca in search of buried treasure. The destruction has not been great, however, and these early diggings were confined exclusively to the forward portion of the shelter, near the cave opening. Mr. Ledig excavated at the site from time to time during the summer and fall of 1930; although he estimates that he removed at least a cubic meter of undisturbed refuse within the shelter, his activities were in the main confined to reworking the rubbish which had been disturbed by former treasure seekers. All of this material was put through a fine screen and, though stone and bone artifacts, antler tips, and other remains were recovered, no potsherds were encountered. This unusual feature—the apparent absence of pottery—was noted by Mr. Ledig at the time of his excavations, since he has long been interested in Peruvian archaeology and is familiar with the better-known ceramic styles.

[3] Antonio Vásquez de Espinosa, *Compendium and Description of the West Indies.* Translated by Charles Upson Clark. Smithsonian Miscellaneous Collections, Vol. 102, 1942. Book IV, Chap. XXXVI, 1339, p. 476.

At the present time, the floor of the rock shelter is littered with broken bottles, charred wood, paper, fragments of modern textiles, and several large potsherds which, since they bear glazed decoration, are presumed to be recent. The cave has obviously been used from time to time by local shepherds and farmers as a temporary refuge during rainstorms. Several sherds of diagnostic late Inca wares were picked up on the slope below the shelter and on the pampa above it; this fact, however, is not surprising, since at least three large sites which pertain to late ceramic cultures are situated in the hills within sight of the rock shelter. Fragments of human bone near the surface of the disturbed debris within the cave may likewise pertain to these late ceramic horizons, since it is known that caves and rock shelters in the Jauja Valley were utilized as burial places during Inca times.

The writer made a cursory examination of the site in 1945, at which time approximately half a cubic meter of undisturbed refuse from the back of the shelter was excavated and screened. This consisted of firmly packed, fine gray ash containing many small particles of charcoal; nine flakes bearing evidence of retouching, including the artifacts illustrated in Figure 11, *f*, *g* and Figure 11, *q*, *t*, as well as fifteen fragmentary animal bones, an antler tip, and numerous unretouched flakes, chips, and cobbles, were recovered.[4] No vegetable remains were noted, and neither bone implements nor potsherds were found. A careful examination of the face of the refuse stratum where it has been cut by the path below the rock shelter revealed more stone artifacts, flakes, and splintered animal bones, but no pottery.

Site No. 2

The rock shelter which has been designated as site No. 2 on the map (Fig. 10) is situated also on the left bank of the Chupaca River some four kilometers to the west of site No. 1 and approximately a kilometer distant from the village of Huayao. Here, where the Chupaca River emerges from a steep-walled gorge, the terraces are very narrow and the drop to the river below is precipitous. The site of the rock shelter is known to the inhabitants of Huayao by the Spanish name *Mal paso*, literally "bad pass," because the trail which winds up the canyon along the narrow terrace is difficult during the rainy season. The shelter has been weathered into the steep face of the second, or middle, river terrace some 80 meters below the *Mal paso* foot trail.

It is unfortunate that the refuse deposits of this site have been so completely obliterated that almost no trace of them may be seen at the present time. In 1941 the owner of the property, Don José Larosa Calderón of Huayao village, filled in the shelter and leveled the terrace in front of it to make a little field. Prior to this date, in 1930, Mr. Ledig excavated at the site; he has kindly furnished the writer with the following information. As he remembers it, the width of the rock shelter was approximately 3 meters, while its depth was about 1.5 meters. Where he excavated within the shelter the height from roof to bed rock was some 2.5 meters. Within the rock shelter proper Mr. Ledig excavated and screened between 2 and 3 cubic meters of refuse material. At the back, against the wall of the cliff, the rubbish attained a depth of 1.5 meters. In 1930 the village of Huayao dug an irrigation canal parallel to the face of the cliff some 10 meters down the sloping terrace below the entrance of the rock shelter. At the bottom of this ditch, which here was excavated to a depth of between 1.5 and 2 meters, human bones, ashes, and charcoal were encountered, and the refuse appeared to continue below this level.

The refuse within the rock shelter proper consisted of dark, firmly packed ash which contained a great deal of charcoal and many splintered animal bones; fragments of deer antler; flakes and chips of flint, silica, and obsidian; and cobbles. Screening of the rubbish resulted in the recovery of a number of stone artifacts (Fig. 11, *l–p*, *u*), but neither bone implements nor potsherds were found. Mr. Ledig states that a large portion of the site remains undisturbed and that the refuse accumulation in front of the shelter is probably sufficiently intact to warrant further excavation.

CHIPPED STONE ARTIFACTS

The collection of chipped stone implements available for study at the present time is, unfortunately, very small; from the two sites combined there are but thirty-three specimens, including whole artifacts and those which

[4] Miss Barbara Lawrence, Associate and Acting Curator of Mammals of the Museum of Comparative Zoology of Harvard University, has kindly written me the following in regard to the above-mentioned animal bones: "I have checked the Peruvian bones briefly; such ones as are readily identifiable are all llama."

FIG. 11.—Chipped stone artifacts from Huancayo rock shelter sites. *a–d*, crude points chipped on one face; *e–h*, crude points chipped on both faces; *i–p*, finely chipped points; *q*, *r*, *u*, side scrapers; *s*, *t*, end scrapers; *v*, core with blade removed; *w*, *x*, prismatic flake blades. *a–k*, *q–t*, *v–x*, from site No. 1; *l–p*, *u*, from site No. 2. (Slightly more than one-half natural size.)

are sufficiently complete to be identified beyond reasonable doubt. Of these, twenty-seven were obtained from or in the immediate vicinity of site No. 1 while the remaining implements were excavated by Mr. Ledig in site No. 2. No attempt is made here to describe the fragmentary artifacts, rejected tools, flakes, and cores which litter the former site and the slope below it.

Of the artifacts described here, nineteen are manufactured of a fine-grained siliceous stone which ranges in color from a near black through gray to brown; four are made of a pinkish flint; seven are of white quartz; and three have been chipped from obsidian. Of the last mentioned, two are made from low-grade material and one from a highly vitrified stone.[5] Cobbles of quartz and nodules of silica and flint occur in abundance both in the conglomerate of the old terraces and in the bed of the Chupaca River below the sites. The source of the obsidian, however, is not known at the present time. Dr. Warren F. Walker has informed the writer that obsidian does not appear to be encountered any nearer, perhaps, than the remote uplands of Huancavelica Department to the south. That many implements were, nevertheless, manufactured or finished at the sites is evidenced by the fact that numerous chips of all materials, including obsidian, are encountered both in the refuse deposits within the rock shelters and scattered widely in the general neighborhood of these sites.

Although it is obvious, considering the small size of the collection, that any classification attempted must be highly tentative, the stone artifacts from the rock shelters include three types of points—all forms collected lacked barbs and well-defined stems—side scrapers, end scrapers, and prismatic flakes which appear to have been employed as knives and which bear evidence of retouching through use.[6] All of the above-mentioned implements are flake tools, shaped both by percussion and pressure techniques; although no core tools such as choppers, hammer stones, etc., were found, it must be pointed out in all fairness that we were not on the lookout for them, and they may very well occur. Polished stone artifacts were not encountered.

[5] The identifications of the materials were kindly made by Dr. Warren F. Walker, Chief Geologist of the Cerro de Pasco Copper Corporation.

[6] The word "point" is employed here merely in a descriptive sense and without the intention of implying the use of these artifacts by those who made them.

Crude Points Worked on One Face

(Fig. 11, *a–d*)

Six such points, all of which have been chipped from silica, are represented in the collection and were found in and around site No. 1. All are made of thick, plano-convex flakes; in three cases, the unworked under surface is slightly concave. In five examples, the flat surface has been left completely unretouched, while in the sixth, three or four small flakes have been removed, perhaps accidentally through use. The chipping on the worked surface is very crude, with the result that the pointed end is dull and blunt. In shape, these points range from a double-ended form (Fig. 11, *a*) to a type which is roughly ovoid in outline (Fig. 11, *c*). The largest specimen in this class (Fig. 11, *c*) is 5 cm. long, 3 cm. wide, and 1.5 cm. thick; the smallest (not illustrated) is 3.3 cm. long, 1.3 cm. wide, and 0.9 cm. thick.

Crude Points Worked on Both Faces

(Fig. 11, *e–h*)

Of the six examples in the collection, all from site No. 1, five are of silica and one is of obsidian. As in the case of the single-faced points, these are made of thick, heavy flakes. Although both surfaces have been worked, the effect is extremely crude; large flakes have been removed alternately from the two faces, producing a deeply rippled edge. The point illustrated in Figure 11, *e*, though also thick and heavy, exhibits finer flaking, perhaps owing to the fact that it is executed in obsidian. The range in form is roughly equivalent to that described for the single-faced points and the pointed ends are similarly blunt and dull. The largest example (Fig. 11, *h*) is 5.5 cm. long, 3.2 cm. wide, and 1.8 cm. thick; the smallest point of this type (Fig. 11, *f*) is 4.4 cm. long, 1.5 cm. wide, and 1.3 cm. thick.

Finely Chipped Points

(Fig. 11, *i–p*)

A total of eleven finely chipped points is represented in the collection, the five best examples of which (Fig. 11, *l–p*) Mr. Ledig obtained through excavation in site No. 2; six were found in site No. 1 and on the slope below it. Of these points, three are of silica, three of flint, three of quartz, and two are chipped from obsidian. In contrast to the crude points described above, these tend to be narrow, thin, and well made,

and all are retouched, presumably in the pressure-flaking technique, on both surfaces. The quartz points in particular, considering that this material is resistant and difficult, are very well executed. Although the points of this type have a clarity of outline, the individual flake scars are difficult to see, with the result that the implements have almost a water-worn appearance. The points are sharp and well defined, and the basal ends are carefully finished. Those illustrated in Figure 11, *k*, *o* tend to have serrated edges. Owing, probably, to the small size of the sample, there appears to be considerable variability in form. The specimen illustrated in Figure 11, *m* (and, presumably, those in Figure 11, *i–j*) tapers to a point and has a thin, rounded basal end, while those in Figure 11, *o–p*, are of a diamond shape, the sides of the butt in each case tapering to an ill-defined stem. That in Figure 11, *l*, is elliptical in form, while the point illustrated in Figure 11, *n*, is double-ended. The largest specimen in the collection (Fig. 11, *m*) is 4.5 cm. long, 1.9 cm. wide, and 0.9 cm. thick; the smallest (Fig. 11, *l*) is 3.3 cm. long, 1.5 cm. wide, and 0.8 cm. thick.

Side Scrapers (Fig. 11, *q*, *r*, *u*)

The three side scrapers are all of silica. Two encountered in site No. 1 (Fig. 11, *q*, *r*) are of the single-edged type and are made of roughly triangular flakes, one edge of which in each case is finely retouched, presumably by pressure flaking. The side scraper from site No. 2 (Fig. 11, *u*) is made of a roughly elliptical flake which has an abrupt end, an abrupt side, and one sloping side. The face is seemingly plano-convex; actually, several flakes have been struck off to give this appearance. The sloping side is flaked by what seems to be percussion technique, and it is possible that one end, which bears traces of retouching, was also employed. The largest side scraper (Fig. 11, *u*) is 6 cm. long, 3 cm. wide, and 1 cm. thick; the greatest dimension of the smallest scraper (Fig. 11, *r*) is 3 cm., the thickness is 1 cm.

End Scrapers (Fig. 11, *s*, *t*)

The collection includes three end scrapers, one of flint, the other two of quartz; all are from site No. 1. The flakes of which the scrapers are made bear little resemblance to one another in shape. Each scraper has but a single retouched edge. The largest (Fig. 11, *s*) measures 3.5 cm. in length, 3.0 cm. in width, and 1.5 cm. in thickness; the smallest (Fig. 11, *t*) is 2.5 cm. long, 1.7 cm. wide, and 1.0 cm. thick.

Prismatic Flake Blades (Fig. 11, *x–v*)

In the vicinity of site No. 1 were noted several cores from which prismatic flakes had been struck; the example illustrated in Figure 11, *v* has, unfortunately, been broken in such a way that no trace of the striking platform remains.

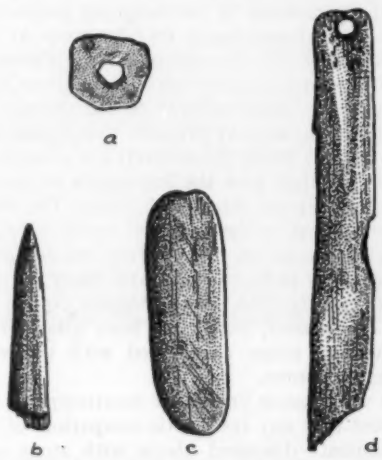

FIG. 12.—Bone artifacts from site No. 1. *a*, bone disk; *b*, bone awl point; *c*, flat worked bone; *d*, perforated flat bone. (Slightly less than one-fourth natural size.)

Of the four prismatic flakes collected, two are of silica and two of quartz. Three show evidences of use retouch, although there appears to have been no conscious attempt made to produce a cutting edge by means of controlled chipping. The longest blade which is apparently complete (Fig. 11, *w*) measures 5 cm. in length.

BONE ARTIFACTS

The five bone artifacts (Fig. 12, *a–d*) in the collection were all excavated by Mr. Ledig in site No. 1. The object illustrated in Figure 12, *a*, is a thin disk, possibly a bead, which measures 2 cm. in diameter and 1 mm. in thickness; two such disks were recovered. The broken awl (Fig. 12, *b*) has a blunt point and is round in cross section. It measures 4.7 cm. in length and 1 cm. in diameter. A worked bone (Fig. 12, *c*) is flat on both surfaces, and all edges and ends have been smoothed. It measures 5.5 cm. in length, 1.8 cm. in width, and 2 mm. in thick-

ness. The fifth object (Fig. 12, *d*) a perforated flat bone, has been smoothed on both surfaces and both edges as well as on the end which bears the perforation. The hole has been drilled from both surfaces. This artifact is 9.8 cm. long, 1.5 cm. wide, and 3 mm. thick.

CONCLUSIONS

While it would obviously be unwise to base any definitive conclusions on evidence so scanty as that presented in the foregoing pages, certain general statements may be made at the present time: (1) The culture of those who occupied the rock shelters appears to have been nonceramic; until evidence to the contrary is forthcoming, we may presume that it was preceramic. (2) While the artifacts are admittedly very few, they give the impression of having been hunting and skin-dressing tools. The crude points, could, probably, have served only for thrusting weapons, or as knives and scrapers; they appear to be too thick and heavy for projectile points. The finely chipped points, on the other hand, may have been attached to projectiles, either darts used with throwing sticks, or arrows.

It would seem premature to attempt at the present time any systematic comparison of the implements discussed above with stone and bone artifacts which occur in such of the better-known early highland ceramic horizons as Chavin, Chanapata, Pucara, Tiahuanaco, etc. It does seem significant, however, that, in all of these sites where they are found, stone and bone artifacts occur with great numerical infrequency as compared with pottery and that, in general, they bear little obvious relationship to the implements from the Huancayo rock shelters. Dr. Gordon R. Willey informs the writer that there is an interesting resemblance between certain of the points described in this paper and some encountered by Strong and Willey in coastal midden sites at Puerto de Supe. At the Lighthouse site a point occurred in association with pottery, and at the Aspero site, while pottery was lacking in the village refuse, a point was found associated with maize; both of these sites, according to Dr. Willey, pertain to the general Chavin horizon. There are, in addition, some obvious comparisons which could be made between the stone artifacts from the Huancayo rock shelters and those excavated by Bird in the prepottery levels of middens on the northern coast of Chile.[7] Further conclusions, however, must await systematic archaeological investigations of the Huancayo rock shelters and of other sites in the Jauja Valley.

Institute of Social Anthropology,
Smithsonian Institution
Lima, Peru
April, 1946

[7] Junius B. Bird, *Excavations in Northern Chile*, American Museum of Natural History, Anthropological Papers, Vol. 38, Pt. 4, New York, 1943. The points illustrated in his Fig. 32, *c*, p. 270, seem to resemble the crude, double-faced points from the Huancayo site No. 1, while that illustrated in the same figure, *b* (extreme right), and those in Fig. 18, *p*, *q*, p. 239, from Quiani in the Arica area appear to be similar to the finely chipped points from Huancayo site No. 2. In addition, the Chilean middens yielded both side scrapers and end scrapers.

THE FORD SITE, A PROTOHISTORIC STATION IN NORTON, MASSACHUSETTS

MAURICE ROBBINS

WITHIN the town of Norton, Massachusetts, close by the boundary between it and the city of Taunton, lies the beautiful little body of water known to this day by its Indian name of Winneconnet. This lake, fed by a system of streams from the north and west and draining southward through a complicated network of ponds, swamps, and streams into the Taunton River, seems to have been the center of a large area of Indian population in ancient times. Cultivation and other disturbances of the earth surfaces have demonstrated the existence of many sites of former Indian habitation, while numerous items in local tradition point to the fact that many Indians lived and died within the township. Hardly a garden plot that has not yielded its quota of stone implements to the collections of local "relic hunters" exists in this vicinity.

Approximately a mile and a half to the south

Huancayo rock shelter sites. *a*, the Chupaca Valley looking west from site No. 1 toward site No. 2; *b*, site No. 1, looking east.

The Ford site. *Upper*, articles of white origin: upper left, five musket balls from section D; below them, three gun flints; center, hand-forged nail; upper right, Van Buren token; below it, fragments of clay pipes. *Lower*, miscellaneous implements from the site.

is the Faulkner Spring site, which was excavated by the Warren King Moorehead Chapter between 1939 and 1944.[1]

The site which is the subject of this paper is located on the north shore of Winneconnet Lake, between the swamp which surrounds the mouth of Mulberry Meadow Brook and the highway (Bay Road) which skirts its eastern shore. The site was a rather extensive one, paralleling the shore line for several hundred feet and extending northward until traces of it are lost in the disturbance attendant upon the building of Plain Street. Unfortunately, a large portion of the area has been disturbed by cultivation from earliest colonial times to the present day and by the erection of summer cottages and the use of the shore for recreational purposes. Action of the water and ice has also caused considerable alteration in that part of the site bordering upon the lake.

The apparent richness of the cultural deposit has long engendered a desire on the part of the writer to carry out a controlled excavation of the site, despite its known disturbed condition. The recent purchase by Dr. Ford of a portion of the shore-front property permitted the realization of this desire. The area known to us as sections A, B, and C is located upon Dr. Ford's property, while the area designated upon our plans as section D—better known to us as Bannerstone Hill, for reasons which will become obvious—is upon the property of Mrs. Coolidge, from whom we purchased the right to limited excavations for one season. Many other property owners have given us permission to sink test pits upon their land, but, as it is felt that we have acquired a generous and representative sample of the culture of the site, further extensive excavation is not deemed advisable.

Before we proceed with a description of our archaeological work at this site, it will be revealing to examine briefly the few facts which local history can furnish with regard to the immediate area and to discuss some of the changes which may have taken place since the aboriginal inhabitants abandoned it.

The only good history of the town of Norton known to the writer is a quite old and rare book written by Mr. G. F. Clarke, in 1859. In this book, Mr. Clarke says:

> The only natural pond is Winneconnet, in the southeastern part of the town, on the shore of which was erected the first civilized habitation within our township. It is a beautiful sheet of water embracing an area of one hundred and twenty-five acres .... To the north of the pond is Great Rocky Hill on which may be found a cave .... the cave itself is a great curiosity, but it has become famous from tradition, which is probably true, that it was once a retreat of the noted King Phillip, when on fishing expeditions to the lake.

It is of interest that the lake is a natural formation and that its size has varied little from 1859 to the present day. Great Rocky Hill, to the north of the lake, was found to be strewn with large boulders, probably of glacial origin, a crevice between two of which forms a rude sort of shelter known to tradition as King Phillip's Cave. This crevice, possibly with some additional structure, might conceivably have served as a shelter against the elements. It may well have been used for this purpose at sundry times by both Whites and Indians. It is quite evident from the disturbance of the soil within the crevice that others have searched here for indications of such use. We found no evidence of Indian occupation here or at any other point on Great Rocky Hill. Tradition, however, is insistent that the great Metacomet once hid here for several days while the doughty Captain Church, having met and defeated him at Bridgewater, vainly searched the countryside for trace of the fleeing Wampanoags. If this tradition be true, then we have grounds for assuming that the village at the nearby Ford

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[1] Maurice Robbins, *The Faulkner Spring Site*. Papers of the Attleboro Museum, Incorporated, Number 1, January, 1944.

The Warren King Moorehead Chapter of the Massachusetts Archaeological Society, having completed and published a report on the Faulkner Spring site, continues its work by presenting this paper based on the results of two seasons of field work at the Ford site, on Winneconnet Lake, in Norton, Massachusetts.

We are indebted to Dr. Kirk Bryan, of the Department of Geology, Harvard University, who made several trips to the Ford site to assist us in solving perplexing problems.

To Dr. Carlton S. Ford, of Attleboro, we are especially indebted for allowing us to excavate upon his property. We have used one, and ofttimes two, of his cottages as living quarters; we have misused, dug up, and trespassed upon his land; and we have seized upon his name to designate the site. It is a great source of satisfaction to know that such friends have sufficient faith in our abilities to allow us thus to impose upon them. Were it not for this most generous cooperation the Ford site would not have been excavated.

As director of the excavation, I cannot omit an expression of my appreciation to the members of the Warren King Moorehead Chapter who labored on this site, overlooking my failings, enduring my errors of judgment, and moving prodigious amounts of earth, to the end that this paper might be written. To them belongs the greater part of any credit that this accomplishment may attain.

site was no longer in existence, else it would have been mentioned by Church in his autobiography.

The first civilized habitation to be built within the township of Norton, mentioned in the above quotation from Mr. Clarke's history of that town, was the home of William Wetherell, Esq.,[2] who came to Norton from the adjacent town of Cohannet, now Taunton. This habitation was evidently an inn, as history tells us that Mr. Wetherell "kept a victualling house for travellers on the Bay Road." It was erected

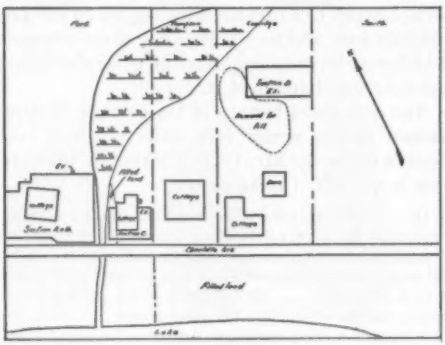


FIG. 13.—General plan of excavations at the Ford site, Norton, Massachusetts.

in 1669, according to Mr. Clarke, and stood by the side of the road until the late 1700's. A number of quaint anecdotes are extant concerning the life and exploits of Mr. Wetherell, but none of them so much as mentions the existence of an Indian village within a few yards of his home, on the shore of Winneconnet. The following tale demonstrates, however, that Mr. Wetherell and his family had contacts with the Indians. Mr. Clarke tells us that ". . . a few years after the first settlement by Mr. Wetherell a party of Indians, who were on a hunting expedition came to his barn one night, and killed a two year old colt, roasted and ate him, and then raked up their coals and departed without disturbing the family." It would seem that, if the site on the lake had been in existence at that time, these Indians would have taken their horse meat home to roast rather than cooking it at the scene of the crime, so to speak. The absence of any reference to such a village in connection with the early history of the town, argues well, I think, for the assumption that it had been abandoned prior to the settlement by Mr. Wetherell in 1669.

Mr. Clarke also contributes an informative bit of geological lore which ties in well with some of our observations related below. He says:

> By clearing the forests, many places which were called swamps, have now (1859) become so dry as not now to be known by that appellation. A remarkable instance is at what two hundred years ago (1659) was called Fowling Pond in Raynham, where no vestige of a pond now remains.

We are also told by Captain Church, in his autobiography, that Phillip once had a hunting lodge at this Fowling Pond in Raynham.

A further bit of information in this regard comes from an ancient map of Winneconnet Pond, drawn by "Morgan Cobb, Surveyor" and dated at "Taunton, May 28, 1728." On this map the size of the lake is the same as that indicated by Mr. Clarke in 1859 and as it is today.

To recapitulate our information from historical sources, we find that Winneconnet Lake was the only natural body of water in Norton, and that it has varied little in size since 1728, but that the water table may have been higher and the lake consequently larger in 1659. We may also assume, on the basis of negative evidence, that the Indian village known to us as the Ford site had been abandoned prior to Mr. Wetherell's coming to Winneconnet in 1669.

Coincident with our first excavation at the Ford site, some time was devoted to observation of the shore formation at various points in an effort to determine what, if anything, existed in the form of direct evidence of changes in the water level and general appearance of the lake since aboriginal times. Reference to Figure 13 will show the location of our several excavations in relation to present water level. Sections A and B are located to the north of a dirt road, called Charlotte Avenue, and are separated from section C by a small brook or ditch which is often dry, but which in the spring drains a small swamp to the rear of the summer cottages. These shore sections are a scant five feet above the present water level of the lake. Reference to Figure 14 shows that the excavations are on a long, narrow knoll which parallels the lake shore at this point. Section D is farther back from the lake, upon a gentle rise of land which extends northward to Plain Street and is approximately 12 feet above mean water level.

[2] It is interesting that William Fontneau, one of our members who dug at the Ford site, is a direct descendant of William Wetherell.

Excavation in the shore sections, A, B, and C, revealed an overburden of sandy loam, varying in thickness from 10 to 15 cm., resting upon a deposit of chestnut-colored soil from 40 to 50 cm. in depth. In that portion of section A southeast of the cottage, this chestnut soil rested directly upon a very hard layer of iron oxide and sand, which varied in color from black to red and in thickness, from 5 to 15 cm. The base was a light to dark gray waterlaid sand of unknown depth. To the northwest, in our excavation, this iron oxide layer disappeared and the chestnut-colored soil rested directly upon the dark sand base. Along the northern edge of the excavation, next to the low area, a wedge-shaped layer of very fine, light gray sand, almost clay at some points, was interposed between the chestnut soil and the dark gray base. The overburden in section D was slightly thicker, the chestnut soil coarser and more yellow in color, while the base was a coarse to fine light yellow sand. The entire excavated area had been intensively plowed, disturbance had taken place in both directions, and considerable earth had been removed from section D and used to fill in the road and shore front and to narrow the brook where it passes under the road. In addition to this, many rubbish pits

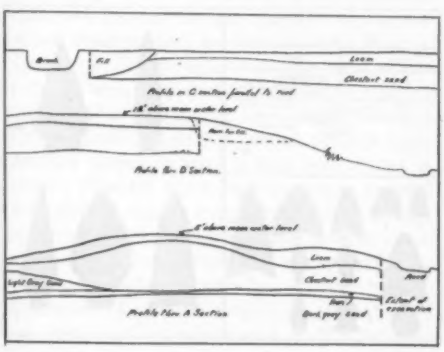


FIG. 14.—Profiles through sections C, D, and A, the Ford site.

had been dug by modern occupants, in sections A, B, and C.

Dr. Kirk Bryan has come to the conclusion that the knoll-like area upon which sections A and B are located was formed by action of storm waves from the northwest, perhaps during some spring when the lake was higher, owing to freshet conditions. A diligent search about the lake has failed, however, to reveal a similar distribution at any other point, except that at one point directly opposite the Ford site the lake, last spring, built a small rampart, 3 feet high, above the present beach level. The deposit of iron, previously mentioned as underlying the stained sand in section A, is thought by Dr. Bryan to have two causes: (a) There

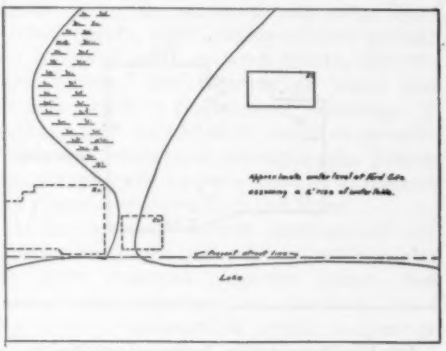


FIG. 15.—Shore line as it would be if water stood two feet higher in Winneconnet Lake, the Ford site.

was a primary leaching of iron salts from above by rain, with a consequent oxidation to produce the chestnut color of the overlying sand. At the east, this downward movement of ground water was halted by an upward movement of ground water which was not quite as deep as it is now. (b) Concentration of iron salts at the place where the ground water and rain water met resulted from a horizontal movement of ground water from the back of the site along the slight drainage channel which has been deepened into the present drainage ditch. The spring to the north also had something to do with the concentrations of salts, and there was also added organic matter because of the moisture. Dr. Bryan also thought it was possible that this staining has occurred during the last two hundred years or less, but there are so many unknown factors—degree of acidity of the water, amount of iron salts in the sand, etc.—that it would be hard to say just how long it would take to produce the conditions observed.

It is interesting to note that we again have a suggestion that at some time in the not too distant past the water table and the lake were somewhat higher than they are today. The presence of artifacts below the iron layer in-

dicates that this layer has formed since they were deposited, as its extreme hardness will admit of no other conclusion. Here, then, is another indication that the site was occupied prior to the drop in water table, or before 1659.

The establishment of a contour at 2 feet above the present level of the lake provides us

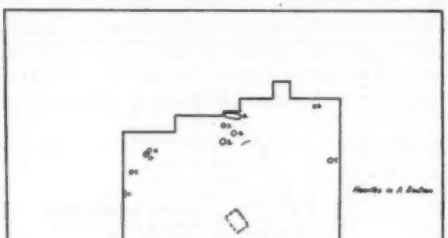


FIG. 16.—Plan of section A, showing positions of hearths, Ford site.

with the outline in Figure 15, which, if our assumptions are correct, shows the relation of water to land at the time of occupation. This distribution will coincide with our assumptions, based upon archaeological data, that the shore area represented by excavations in sections A, B, and C was not the site of wigwams but may have been a workshop area in which implements were made, and that the living areas were farther north, at a somewhat higher elevation, away from the spring freshets and winter ice. Extensive cultivation, however, prevented excavation on this higher ground except at the point known as section D.

RESULTS OF EXCAVATION IN SECTIONS A, B, AND C

In evaluating the following data from the shore sections of the Ford site it will be well to keep in mind that there has been considerable disturbance of the soil since the deposition of the Indian material. It has been demonstrated that the area was subject to action of water and ice. In addition to this, there has been an appreciable alteration in the various strata by cultivation and by occupation in recent times. At several points, pits for the reception of refuse have been dug by white occupants, so that it is altogether possible that some of the European artifacts classified below may have been introduced at a time subsequent to Indian occupation. It would seem advisable to view the data as to vertical distribution with some reserve.

Throughout this entire area, numerous but indefinite deposits of dark soil containing charcoal, cracked and burned stones, and bits of calcined bone, were observed. This condition was especially true of the squares adjacent to the ancient shore of the lake. Only eleven of these deposits were definite enough to be called hearths; the relative positions of these are shown in Figure 16. All of these were simple, saucer-shaped depressions in which concentrated deposits of dark soil, cracked and burned stone, and calcined bone were present. With the exception of Hearth 10, all were located at or just below the junction of chestnut soil and the overburden of humus. The upper surfaces of many of the hearths appear to have been disturbed in the course of the cultivation of the area. Hearth 1 contained, in addition to the usual refuse from a camp fire, a grooved weight, a triangular projectile point, a beautifully made felsite spear or lance blade with a side-notched, concave base, and a flat, irregularly shaped fragment of shale bearing marks

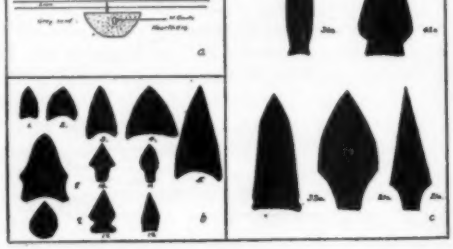


FIG. 17.—The Ford site. *a*, profile through section A, to show relation of Hearths 10 and 11; *b*, shapes of projectile points, and knives; *c*, shapes of spear points.

of work. Hearth 5, which probably should not have been included in this category because of its disturbed condition, produced a small white quartz point, triangular in outline. Because of their vertical positions, Hearths 10 and 11, shown in Figure 17, *a*, are worthy of special mention. Hearth 11 was located in chestnut soil a few centimeters below the plow line, and

was apparently undisturbed. Hearth 10 was found at a depth of 60 cm., below and slightly to one side of Hearth 11 and separated from the chestnut soil by a very hard and distinct layer of iron oxide. The relative positions of these hearths indicate clearly that the lower was constructed prior to the upper and that some time must have elapsed between the construction of the two. It is, of course, possible that the intervening layer of iron oxide was deposited long after both hearths were built, and it is also possible to consider the lower of the two as the base of a refuse pit the upper portion of which was destroyed prior to the building of Hearth 11.

Two post molds were found adjacent to Hearth 5. Both were 6 cm. in diameter, and the top of each was 6 cm. below the junction of humus and chestnut soil. One mold, with a length of 20 cm., terminated in a blunt or rounded point, while the other, but 10 cm. long, had a pointed base. It is quite possible that these molds are of more recent origin than the Indian occupation of the site, as the adjacent hearth (5), which was slightly lower in vertical position, had been greatly disturbed. It seems likely that the disturbance would have involved the post molds had they been present. It is interesting to note that most of the definable hearths are located in that portion of the excavation least subject to disturbance.

Two large, flat stones, evidently used as anvils or mortars, were found in the excavation of section A. One was at the junction of chestnut soil and humus, carefully placed upon a layer of smaller stones so that it was held firmly in position; close by lay a hammerstone, a small quartz flesher, and a rough hoe-like tool. The other flat stone was deeper in the chestnut soil, at a depth of 38 cm., and was accompanied by a well-made muller or grinding stone.

Evidence of a small building, probably of white construction, was found at the position indicated by the dotted lines in Figure 16. This structure was represented by decayed and charred sills, numerous hand-forged nails, a portion of a hinge, and a small metal token. The token, which bears the embossed bust of a man and the words "Martin Van Buren—Born December 5, 1782" on one side and "Free Soil and Free Labor" on the other, dates the structure from the campaign of Van Buren for the presidency in 1856.

A total of 317 artifacts of Indian origin and eighteen of white or European origin were found at various depths in this section of the site. Their vertical distribution was as follows.

On the present surface: three triangular and eight plain stemmed projectile points; two hammerstones; four large, rough tools; and a clay pipe of Indian manufacture. The last-named object was given to us and is said to have been found here several years ago.

In the humus or overburden: forty-nine triangular projectile points; twenty-seven side-notched points; eight corner-notched points; two stemmed spear or lance points; thirteen small fleshers; five large rough tools; one notched weight; a fragment of plumbago; a muller; a hoe; an adz blade; and two bannerstones, one tubular and one bipennate. Eleven hand-forged nails and the bowl of a colonial clay pipe also were found in this layer.

At the junction between chestnut soil and humus: twenty-two triangular projectile points; five plain stemmed projectile points; two small scrapers or fleshers; two sherds of Indian clay pottery; one notched weight; a spear or lance point; a fragment of a bannerstone, and nine unidentifiable Indian artifacts.

In the chestnut soil at varying depths: fifty-one triangular projectile points; twenty-nine plain stemmed points; two side-notched projectile points; four large, stemmed spear or lance blades; fourteen small fleshers; ten hammerstones; a large chipped semilunar knife; two gouges, one well made and one broken; an anvil; a mortar with muller; a fragment of plumbago; six crudely chipped blades; four mullers; a notched weight; the point of a large spear or knife; three gun flints of European flint; and a fragment of the stem of a white clay pipe.

In or on the layer of iron oxide: three triangular projectile points; two plain, stemmed points; one point of yellow chert with corners removed; a hammerstone; and two unidentifiable artifacts.

In dark gray soil beneath the oxide, at a depth of 60 cm. or more: a large felsite blade; two triangular projectile points; one plain stemmed point; and a large fragment of felsite from which several long flakes had been struck.

DESCRIPTION OF ARTIFACTS FROM SECTIONS A, B, AND C

Rough Stone Tools

The objects included in this category are in most cases but slightly altered to fit them for

use as tools. Although a functional term, suggesting a possible use, is in some instances assigned to a given artifact, this has been done with reluctance, as the writer is of the opinion that such terms are often in error.

Mortar and anvil. The two flat stones alluded to above as a mortar and an anvil were found in such a position as to indicate that they had been in use as suggested. The mortar was a water-worn fragment of shale, measuring 40×28×8 cm., with a shallow depression, evidently worn by use, running along the longest axis on one surface. A muller or rubbing stone was found in place upon its worn surface. The anvil was a granite slab, found carefully set upon a number of smaller stones so that it would not rock when pounded upon. It measured 36×28×7 cm.

Weights. One weight, found in Hearth 1, was of very compact granite, oval in shape, and about 8×7×5 cm. in size. A deep groove had been pecked all about its longer axis. I know of no good reason why this implement could not have been hafted and used as an excellent war club. A fragment of shale, measuring 10×7×3 cm., and very irregular in outline, had been roughly notched on opposite sides. Two smaller pebbles, the size of small hen's eggs and distinctly notched on opposite sides, complete the list of weights found in this section.

Choppers. Five so-called choppers, or hoes, made from field stone were found at various points in the excavation. These implements, although varying in size from 14×6 cm. to 7×3 cm., are all of similar outline, being wider at the blade than at the upper end. They are pecked on all surfaces but are not provided with any apparent notches for hafting. Mr. William Fowler has suggested that these implements could be hafted and used as digging tools, to which use I see no objection.

Hammerstones. Twelve pebbles and fragments of rock were found which, to judge by their battered surfaces, were probably used as hammers in the manufacture of implements. These vary in weight from three pounds to a few ounces, are spherical, egg-shaped, or irregular fragments, and have been altered in no way except by use. Only those stones which showed a considerable use were included in this category, else the number would have been much greater.

Rubbing stones or mullers. Five such implements were recovered from these sections. All were roughly rectangular stones with two flat, smooth surfaces which seem to have been rubbed or ground. They could have been used in the reduction of corn or nuts to flour, or they may equally well have been used in polishing stone implements. Even the fact of their having been Indian implements is not established, as they are altered in no way save for the grinding of their flat surfaces.

Plumbago. Two small fragments of this material, showing scratches upon all surfaces, attest to its use as a coloring material at this site.

Chipped Implements

Projectile points and small chipped knives. As is usual, the largest number of implements found at this site were small chipped implements, most of which were undoubtedly used as projectile points. Some of those included in the following classification may have been intended for use as knife blades, as an occasional artifact is asymmetrical in outline. When these asymmetrical implements are held so that the long axis is horizontal, their outlines seem more nearly to approximate those of knives than those of balanced projectile points. For the sake of simplicity, however, these have been included in the general category of small chipped implements.

Again, it seems well to call the reader's attention to the inherent faults in any system of classification founded upon arbitrary geometrical shapes. The classification used in this report is one adopted by the Massachusetts Archaeological Society and published in its Bulletin.[3] This system is based upon the determination, for a geographical area, of the range and variation in geometrical shapes of artifacts. It has been assumed that the number of artifacts belonging to the different shape categories is an expression of the industrial habits of the occupants of a given site and that these numbers constitute a convenient means of comparing one site with another. Such an assumption is subject to many errors. These selected shapes are purely arbitrary. Aboriginal concepts are not recognized, and the material used in the manufacture of the implements is of such a nature that a control close enough to insure the achievement of a predetermined outline is most improbable. The classification must be considered only as a convenient means of

[3] R. P. Bullen, "A Proposed Massachusetts Projectile Point Classification," *Bulletin of the Massachusetts Archaeological Society*, Vol. IV, No. 3, April, 1943.

describing and comparing this type of artifact.

The material most extensively used at the Ford site in the manufacture of small chipped implements was white quartz. Fifty-eight per cent of the implements of this type recovered and classified were of this easily obtained stone. Felsite was used for the manufacture of twenty-five per cent, and shale for twelve per cent. Black flint and a yellow chert were present in the category but in insignificant quantity.

It seems significant that more than sixty-six per cent of all projectile points were of the stemless, pure trianguloid type, and that the larger part of these were of small size. Twenty-two per cent were small points of the stemmed variety. In all, over eighty per cent of these small chipped implements were not over 4 cm. in length, impressing one with the evident intent to produce a small, light-weight artifact.

Spear or lance points. Types of spear or lance points found at the Ford site are illustrated in Figure 17, *c*. Eight such artifacts were recovered from these sections, four of them represented by broken butt sections only. The longest of the four complete artifacts is 10 cm. long, while the remaining three measure 7 cm. in length. One specimen was found in two parts, the base being in the loam at a depth of 10 cm. and the point in chestnut-colored soil a few meters away, at a depth of 20 cm.

Fleshers or scrapers. Five definite shapes can be found among the fifteen small white quartz fleshers or scrapers recovered: (1) four roughly rectangular fragments, chipped about three sides to a fine edge but unprovided with evident means for hafting; (2) two, similar to those above, but with incurving sides on their long axis; (3) three of triangular shape, the wide base retouched on both sides to form the working edge, the butt relatively thick and round in cross section; (4) four definitely stemmed implements with blunt rounded blades, retouched on both sides to create working edges; (5) two pyramidal shaped blocks of quartz, with one or more edges slightly hooked.

There were two additional implements of the stemmed variety, one of felsite and one of biotite, slightly larger in size (3×4 cm.), while the rectangular variety was further represented by five specimens of larger size (4×6 cm.) in biotite, felsite, and shale.

In addition to the above specimens, there were some twenty-five or twenty-six additional worked fragments of white quartz which may have been broken fleshers or scrapers, but

CLASSIFICATION OF CHIPPED IMPLEMENTS IN SECTIONS A, B, AND C

Type	W.Q.*	QZ.	F.	S.	M.	Total
1	3					3
2	49		4	1	1	55
3	17	1	23	8		49
4	13		8	1		22
5	1	1	2	2		6
7			4			4
9	4					4
11	31	1		6		38
13	1		1			2
17			1			1
19	4					4
21*a*			1			1
32*a*			1			1
33*a*					2	2
34*a*			1			1
22*b*					1	1
33*b*				1		1
42*b*			1			1
43*b*			3			3
49*b*			1			1
33*c*				1		1
34*c*			1			1
32*d*			1			1
44*d*	2					2
45*d*				1		1
48*d*			1			1
30*e*		1				1
33*e*				1		1
44*e*	2		2	2		6
45*e*		1				1
46*e*				1		1
48*e*				1		1
50*e*				1		1
	127	5	56	27	4	219

CLASSIFICATION BY GROUPS

	W.Q.	QZ.	F.	S.	M.	Total
Group 1	83	2	37	12	1	135
Group 2			4			4
Group 3	40	1	2	6		49
Group 4			1		1	2
Group 5		1	2			3
Group 6			2	3	2	7
Group 7			4			4
Group 8	4	1	4	6		15
	127	5	56	27	4	219

CLASSIFICATION OF LARGER CHIPPED IMPLEMENTS (PROBABLY SPEAR OR LANCE POINTS) IN SECTIONS A, B, AND C

Type	F.	QZ.
21*a*	4	
21*c*	1	
33*a*	1	
36*e*		1
42*a*	1	
	7	1

* W.Q., white quartz; QZ., quartzite; F., felsite; S., shale; M., miscellaneous.

which were not susceptible to classification because of the vagueness of their outline.

Large blades or knives. One chipped blade of felsite, 9 cm. in length and 3.5 cm. wide at its center, with rounded ends and sides tapering from the center toward each end, was found at a depth of 67 cm. at a point below the iron oxide layer in section A. This was the greatest depth at which an implement was found at the Ford site.

A large semilunar blade of felsite, chipped but unpolished, came from the last square to the north in section A, close to the edge of the swamp land which terminated our excavation in that direction. This implement is 20 cm. in length and nearly 10 cm. broad at its widest point.

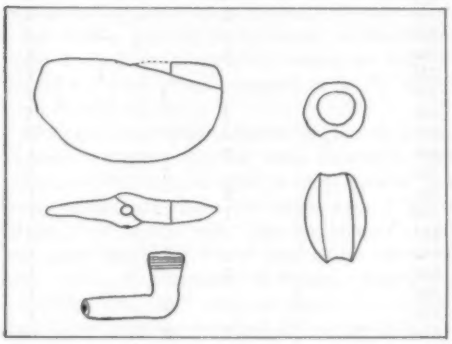


FIG. 18.—Problematical objects from the Ford site, and pipe said to have been found there.

Pecked and Polished Implements

Gouges. One complete pecked and polished gouge and four broken ones were recovered from these sections of the excavation. The complete specimen is made of a very compact stone, is 13 cm. in length and 4.5 cm. wide at its cutting edge. The implement has seen much use; its cutting edge is scored by work and its poll battered by much pounding. The remaining specimens consist of two cutting edges and the polls of two slightly larger implements. Mr. Elmer E. Tufts, Jr. has two nearly perfect gouges found several years ago on that portion of the site now known as section D.

Pestles. One fragment of a cylindrical pestle was found on the surface before excavation was commenced.

Bannerstones. Of great interest, in view of later discoveries in section D, are two types of bannerstone in this section of the excavation. The specimen shown in Figure 18 is a winged, or bipennate, bannerstone. This artifact is made from a very compact piece of banded slate. It has been pecked into shape but is imperforate and unpolished. Drilling had been started on the upper surface, where a smooth circular depression with a central pit, usually the product of reed and sand drilling, had penetrated the stone to a depth of about 3 cm. Very evidently the turning of the drill had broken off a wedge-shaped fragment from one wing, whereupon the blank was discarded. A part of this broken-off fragment was found later, about 300 cm. from the implement. This artifact was found at a depth of 15 cm. in the humus layer.

A smaller variety of bannerstone, also shown in Figure 18, was found at a depth of 6 cm. in the humus layer. This argillite implement is an egg-shaped object, both ends of which have been flattened and cupped. A broad, shallow depression runs along its long axis on one side. The object is also unperforated and unpolished.

Two additional fragments of bannerstones, both wings broken along the central perforation, were recovered in these sections.

Indian Clay Artifacts

Three very small sherds of mineral-tempered and two sherds of fiber-tempered clay pottery were found at the plow line in disturbed soil in section A, near the front steps of the cottage.

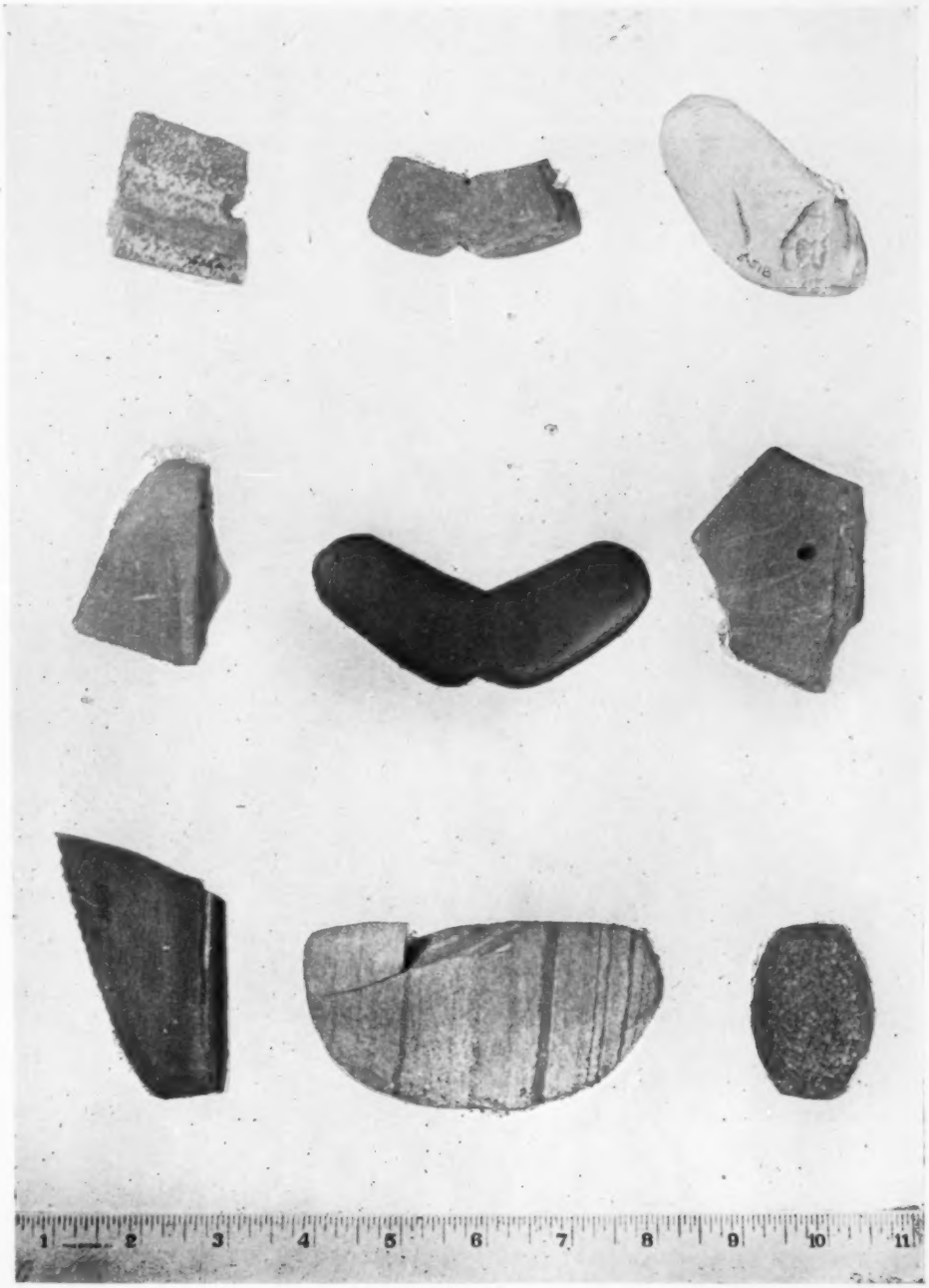
A beautiful right-angle clay elbow pipe of Indian origin was given to us by a person who formerly hunted the surface of the site. It is said to have been found in this section several years ago.

Articles of White Origin

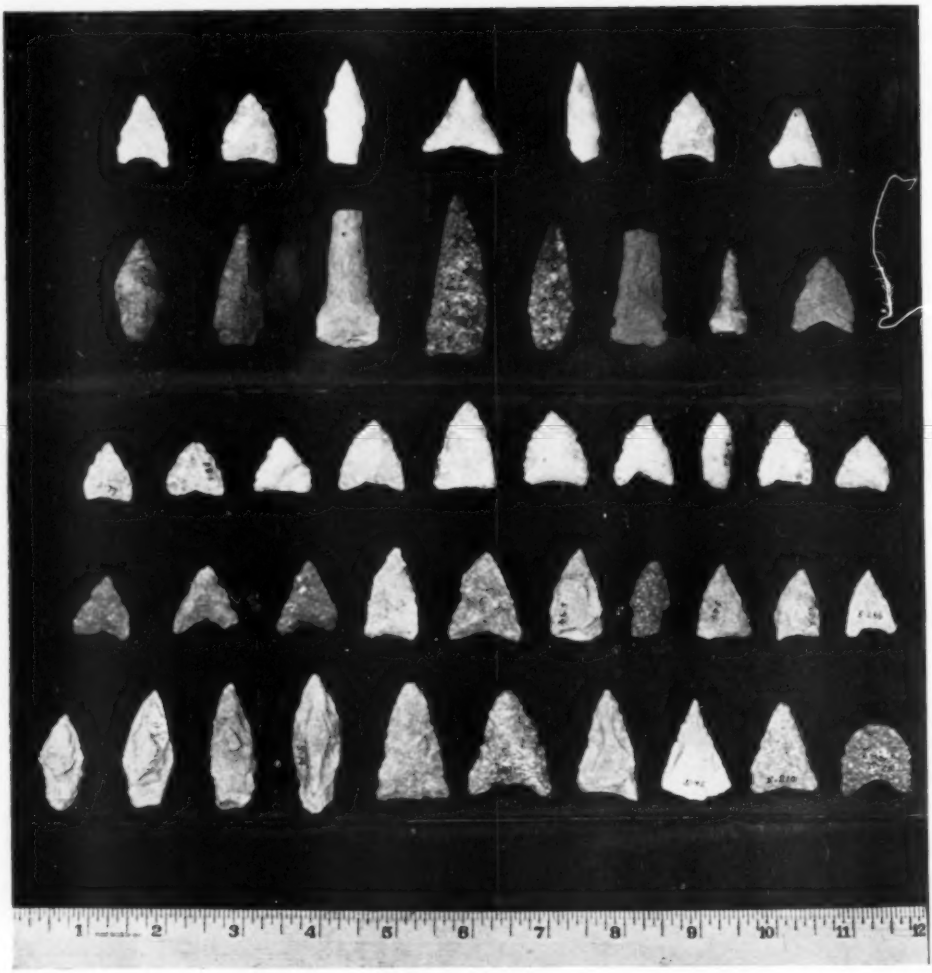
Three gun flints, two of black and one of a light yellow European flint, were found at a depth of 45 cm. in the chestnut-colored soil, 35 cm. below the plow line in section A.

Two fragments of white clay pipes were found; one was a bowl section, the other, a part of a stem, including its junction with the bowl. The bowl section was in the humus layer and the stem section was in chestnut-colored soil at a depth of 40 cm. These were of early colonial pattern, but they may, of course, have been introduced long after Indian occupation had ceased. In addition to the above, a great many hand-forged nails were found in the humus layer and in the chestnut-colored soil near its junction with the humus.

It is worthy of note that no grooved axes,



Problematical objects from the Ford site. Lower center and lower right from Section A; others from Section D, Bannerstone Hill.



Types of projectile points and drills from the Ford site.

celts or stone drills were recovered from this section of the site and that only a fragment of a stone pestle was found. Also, as seems to be the rule on southern New England sites, bone tools are conspicuous by their absence, and clay pottery is at a minimum.

RESULTS OF EXCAVATION IN SECTION D

Being satisfied that sections A, B, and C of the Ford site had been greatly disturbed, and feeling that the habitation sites of the aboriginal people would have been situated on higher ground away from the danger of water action, we were very desirous of continuing our excavations at some such point in the immediate area. We accordingly purchased the right to excavate for one season at a spot some 225 feet from the shore of the lake on an elevated plain, to the northeast of the previous sections. We found that a portion of the southern slope of this elevation had been removed for use as fill at the time when Charlotte Road was built and at various other times as fill was desired (see Fig. 13). Starting within this area of disturbance, we staked out the usual grid to the edge of the property line, where a garden now exists. This entire area had also been under cultivation at some earlier time, and rhubarb plants and small fruit trees created small areas of recent disturbance at various points. The overburden of humus was fairly consistent throughout the area, resting upon yellow sand and fine gravel, which in turn was deposited upon a base of fine sand, white to yellow in color. The vertical distribution of artifacts in this section may have somewhat more significance than that in the shore sections previously described. While the humus and the upper portion of the strata directly beneath it were greatly disturbed by cultivation, the yellow soil at most points seemed to have been undisturbed since Indian occupation. Many artifacts were found below the area or zone of disturbance, apparently in situ. The vertical distribution of all artifacts recovered in this section, including many broken fragments which could not be classified, was as follows: in the loam or humus, ninety; in the junction zone, fifty-four; and in the yellow soil, ninety-five.

In this section, also, many fragments of burned and fire-broken stone were aimlessly scattered about. Calcined bone, in minute fragments, seemed a bit more frequent than in the sections previously described.

One true pit, the only such structure found at the Ford site, was found at the location shown in Figure 19, *a*. A plan and cross section are illustrated in Figure 19, *b*. Four hearths, similar in every way to those found in the shore sections and described earlier, were found in section D, at locations shown in Figure 19, *a*.

A series of post molds was discovered (Fig. 19, *a*). Although these are adjacent to one another, they, unfortunately, are also adjacent to the cultivated area upon which we could not

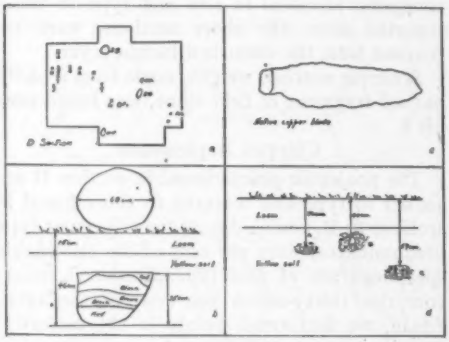


FIG. 19.—The Ford site. *a*, plan of section D, showing features uncovered; *b*, plan and section through pit 1, section D; *c*, outline of native copper blade found in section D; *d*, schematic elevation to show mode of occurrence of musket balls and Indian artifacts in section D.

excavate. It is probable, however, that even could we have searched beyond the limits of our excavation for companion molds, we would have failed to find them because of disturbance resulting from cultivation. The curve of the line of molds, however, would seem to indicate that if companion molds were present originally, they would have been situated within the limits of our excavation. There was no indication of a floor within this curve of molds, so it is not even possible to guess at their purpose. The tops of these molds seem to have been cut off in some previous cultivation.

DESCRIPTION OF ARTIFACTS FROM SECTION D

Rough Stone

A flat, waterworn pebble, measuring 36×16×10 cm., roughly oval in outline and badly battered on both flat surfaces, was recovered from a pocket of darker soil in the yellow soil at a depth of 35 cm. We have assumed that

this stone was used as an anvil. Only three hammerstones were found in section D, all of them egg-shaped, waterworn pebbles of fine-grained stone, battered at one or more points upon their surfaces.

A part of the circumference of one very rough circular fragment of a shale-like rock seemed to suggest a blade, while a notch at either side may have provided means of attaching the object to a handle. It could have been used as a sort of spade or hoe.

Two implements, which might be called choppers, identical in size and type to those reported from the shore sections, were recovered from the disturbed humus layer.

A simple notched weight, made from a badly burned fragment of field stone, was found near pit 1.

Chipped Implements

The projectile points found in section D are similar in type and material to those found in sections A, B, and C. Again, the triangular type predominates; sixty per cent of the classifiable specimens are of this type. Stemmed points comprise thirty-seven per cent of the total. Again, we find small points in the majority; indeed, no spear or lance points were found in this area. Sixty-five per cent of the material used is white quartz, and thirty-seven per cent is felsite. There follows a classification similar to that presented above:

Type	W.Q.	F.	S.	Total
2	10			10
3	10	1		11
4	3	5		8
5		1		1
9	1		1	2
11	6	3		9
13		1		1
16		1		1
19	3			3
20	1			1
21*e*		2		2
33*e*		2		2
	34	16	1	51

Drills. Three stone drills, all of felsite, two broken and one complete, were found in section D. They were all of the expanded-base type. The complete drill is 3.5 cm. in length by 1 cm. wide at the base. It is probable that the other two were longer, since they are 2.5 cm. wide at the base.

Knives. In addition to those knives which may have been included in the classification of small chipped implements above, there were found two oval blades of felsite, roughly 6×2 cm. in size, which will admit of no other intelligible classification.

Fleshers or scrapers. Seven of these implements, all of white quartz, were found. Two are of triangular type, one is oval, and three are of the stemmed variety, as described in the previous sections.

Pecked and Polished Implements

Pestles. One rather well made cylindrical pestle, oval in cross section and 30 cm. in length by 22 cm. in circumference, was found at a depth of 53 cm. on fine white sand. Two deep grooves parallel to the long direction of the implement had been worn, one on each of two slightly flattened sides. One groove was 17 cm. in length and the other, 10 cm. One end of the pestle was considerably battered by use.

Gouges. Three fragments of gouges, one a rather small and delicately made implement, represent this type of artifact in section D.

Problematical forms. One complete bipennate bannerstone and thirteen broken fragments of either bannerstones or gorgets—it is often impossible to distinguish between these forms when only a fragment remains—were recovered in section D. The associations in which these artifacts were found seem to have as much significance as the presence of the objects themselves. These associations, illustrated in Figure 19, *d*, will be described in detail below.

The complete bannerstone (Fig. 20, No. 510) is of highly polished compact black slate. The wing fragment of a second bannerstone of similar design is of light yellow shale and is also polished (Fig. 20, No. 518); this artifact had been broken along its central perforation. Three broken wings of a more angular type of bannerstone, one bearing notches along its outer edge (Fig. 20, Nos. 511, 523, 534), were made of slate. Two additional fragments, one of slate and one of shale, are of the butterfly type and were found in section A. Two fragments of a notched rather than perforated type, of unpolished shale, add a fourth type to our list. Three additional fragments may be either from bannerstones or gorgets, being so broken as to defy identification. One very definite fragment of a gorget is of a mottled green slate (Fig. 20, No. 535).

The fragments of bannerstones, Nos. 516 and 523, shown in Figure 20, and No. 417, not illustrated, were found singly, two in the humus layer and one in the yellow soil at a depth of 20 cm., without other association.

The complete black slate bannerstone (No. 510) was also without association, but was found in the very disturbed section where soil had been removed for use as fill elsewhere.

One fragment (No. 511) was found in the back fill of pit 1 and it is not known whether or not it had been deposited in the pit.

Two fragments of bannerstones, Nos. 524 and 534A, were found together in a pocket of dark-colored soil at a depth of 50 cm. in the yellow soil. Four other fragments (Nos. 426, 427, 428, and 429) were also in a pocket of dark-colored soil at a depth of 59 cm. in the yellow soil. The gorget fragment (No. 535A) and a bannerstone fragment (No. 535), together with two lead musket balls, were taken from the ever-present pocket of dark-colored soil, beneath several fragments of burned stone, at a depth of 50 cm. in the yellow soil (C in Fig. 19, *d*).

Gouges. Four broken gouge blades were found in section D. One (No. 530) was found in association with three musket balls in a pocket of dark soil at a depth of 40 cm. in the yellow soil (B in Fig. 19, *c*).

Native Copper

The implement shown one-fourth size (Fig. 19, c) was found at a depth of 20 cm., resting on yellow soil at the plow line. This artifact had evidently been pounded into shape while cold. A small portion of the haft had been folded back upon itself, possibly to strengthen it at the point of attachment to its handle.

Dr. Arthur W. Peterson, of the Metals and Controls Corporation of Attleboro, who kindly made a spectrographic examination of the artifact for us says: "We find that zinc, tin, and aluminum are absent as alloying elements. There is indicated a small amount of silver and a trace of iron. From these data we conclude this to be a sample of native copper, probably from the Great Lakes region."

Clay Pottery

A total of eighty sherds of clay pottery of Indian origin were found in section D, concentrated at the junction of the yellow soil and humus or in the lower part of the humus layer itself around Hearth 12. This pottery is of poor quality, grit-tempered, and cord-marked. The coils from which the vessels were formed separate easily while the sherds are yet damp; sherds which retain their original thickness are about a centimeter thick. Several rim sherds indicate that the vessels were not decorated about the rim and that collars were not present. It is probably reasonable to assume that the vessels represented were of a simple Woodland type.

Human Bone

Two molar teeth, a fragment of long bone, and one vertebra were found in the disturbed humus in one square of section D. The two teeth are definitely human. The other bones were identified as human, and as probably of an infant, by two medical men who were consulted. It must be stated, however, that a third medical man was doubtful as to the human origin of this material, except for the two molar teeth. The presence of this material in the very greatly disturbed humus layer is of little significance in this study.

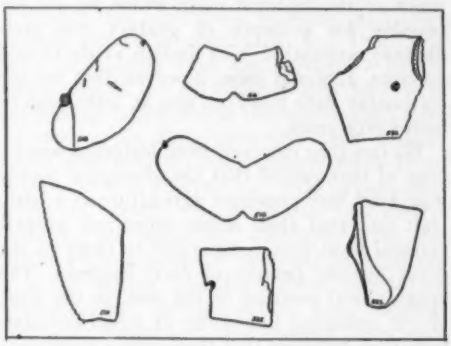


FIG. 20.—Outlines of bannerstone and fragments of bannerstones from section D, the Ford site.

CONCLUSIONS

The foregoing data secured in excavating the Ford site leave much to be desired, as is usually the case. In New England, soil conditions, climate, and intensive white occupation have combined to destroy much of the evidence of the aboriginal culture which once existed. It is most evident that we have not found the area of intensive Indian habitation at the Ford site. A few post molds, but one true refuse pit, and few hearths were located. There was no indication of house types. Ceramics, while present, were in insufficient quantity and state of preservation to allow description of this important trait. The lack of osteological remains leaves us without an idea of the physical type of the aboriginal inhabitants, except in a most gen-

eral way. Present conditions, however, are not conducive to additional excavation.

Historical evidence alone seems sufficient to support the conclusion that the Ford site was inhabited by Indians during the primary stages of contact with Europeans but that it was abandoned at some time prior to white settlement in the immediate area. The evidence of gun flints, musket balls, and fragments of colonial clay pipes serve to strengthen this conclusion. We must, however, take into consideration the greatly disturbed condition of the upper strata and admit the possibility that much of the material upon which we are depending for evidence of contact was accidentally associated with Indian artifacts and deposits. It would seem, however, that we can reasonably date the Ford site at 1600, plus or minus fifty years.

We can then conclude from historical knowledge of that period that the aboriginal people who lived here possessed agriculture as a basic trait and that their house types and general cultural level were comparable to those of the other historic peoples of New England. The geographical position of the site, in the light of our historical knowledge of tribal distribution, then indicates that these people were most probably a band of the Wampanoag tribe, a group prominent in the later colonial history of the area.

The presence of several types of bannerstones at this site is a most interesting development. To find them among the artifacts of a protohistoric people is both startling and significant. The reader will recall that the specimens which we found consisted of both finished and partly made implements, that many had been broken with apparent intent, and that in one instance a broken gorget was associated with musket balls in undisturbed strata. It is, of course, altogether possible that more than one period of occupation is represented here, and that the bannerstone complex may have belonged to the earlier. Objects of this category could have been found by a later people, used by them for a purpose foreign to their original design, and left in situ with elements of the later culture complex. Such a happening would introduce error into our concept of the latter. It would seem desirable to find this condition repeated at one or more sites before we come to a definite conclusion in this regard.

The bulk of present evidence would seem to indicate that the bannerstone was a trait of the atlatl, or spear-thrower, complex. If this be correct, an atlatl-using people once lived at the Ford site. Two alternative conclusions then present themselves to us; either the object is out of place in the protohistoric culture, or the spear-thrower complex was not unknown to the protohistoric people of New England. The writer is inclined to consider, as an interpretation of these phenomena, the possibility that remnants of a people possessing traits of an early culture may have persisted in New England into the historic period. It is possible to assume that traits which are early or prehistoric in the New York area, for example, may be late for some sites in New England. We must not forget that the disturbed conditions at this site, upon which I have perhaps commented too much, may have introduced errors into our observations and into our conclusions drawn from these observations.

A summation of our observations at the Ford site produces the following trait lists: Projectile points indicate some range in form, the concave-based triangular form being most common, with the plain stemmed, and the side-notched types constituting a large part of the remainder. Spear or lance points are relatively rare, but when found they are of the corner-removed, stemmed type. Small chipped scrapers or fleshers are quite common; stone drills are present; and many of the small chipped implements which were classified as projectile points were probably used as knives. Rough stone artifacts are represented by crude digging tools, hammerstones, anvils, mortars, notched and grooved weights, and a questionable sinew stone. Pecked and polished implements include the cylindrical pestle, bannerstones, gorgets, gouges, and weights or club heads. Also present are simple clay pottery of the Woodland type, a native copper implement, and items of European origin such as gun flints, clay pipes, and musket balls.

Pits were very scarce, only one being identified as such. Shallow hearths, seldom containing cultural material, were fairly numerous, but no evidence either of types of habitation or of mortuary customs was found. Absent from our trait list are steatite dishes, bone artifacts, grooved axes, adz blades, celts, and plummets; all of these, with the exception of bone tools, are commonly found in the area.

In his *Pre-Iroquoian Occupations of New York*, Dr. William A. Ritchie, in describing the Coastal aspect of the Woodland phase, says:

The aggregate of the testimony affords the following list of characteristics of the "Early" Focus: the grooved axe; celt; sinewstone; cylindrical pestle; unpitted and pitted hammerstone; anvilstone; notched, grooved or perforated bannerstone; gorget; projectile points and knives of several forms, viz., lozenge- or semilozenge-shaped, stemmed, corner- or side-notched and triangular, sometimes pentagonal; drills and scrapers of several kinds, chiefly the simple oval end form of the latter; pottery and stone pipes of tubular and obtuse angle elbow type; and crudely fashioned, conical, U-shaped or lemon-shaped vessels, grit- or more rarely shell-tempered, fabric-impressed, dentate stamp-marked or occasionally incised. Little bone and shell work has been found; a few rude splinter or whole bone awls, flat needles, conical antler arrowpoints, antler flakers, and cups made from both the box turtle and conch shell virtually exhaust the list.

In describing the Van Orden site, a late component of this aspect, Ritchie, quoting Vincent J. Schaefer, of the Van Epps-Hartley Chapter of the New York State Archaeological Association, notes that at this site pits were nonproductive of cultural material and that the broad concave-based triangular projectile point was most frequent. Bone was rare, being represented by only a few splinter awls and flat perforated needles. The relative rareness of bone tools suggests little use of this medium, for the excellent condition of those found and the many animal and fish remains prove that disintegration cannot have been a factor in their scarcity.

At the Schermerhorn component of the Coastal aspect, ascribed by him to the Early focus of the aspect, Ritchie notes that narrow, stemmed points are preferred to triangular forms, and that scrapers are abundant. I suggest a consideration of the similarities of these New York sites to the Ford site.

It also seems of value to compare the Ford site with sites in New Jersey, particularly the sites at Rosencrans Ferry and Red Valley. Dr. Dorothy Cross, in *The Archaeology of New Jersey* (Volume 1), says that at the Rosencrans Ferry site plain stemmed projectile points predominated, but that side-notched and triangulas points were a close second and third respectively. Present also were convex-based spear or lance points, scrapers, drills, knives, hammerstones, pestles of the cylindrical or roller variety, anvils, a doubtful hoe, gorgets, pendants, broken bannerstones, and fragments of steatite bowls. Bone implements were meager. Pottery was of a fine texture and tempered with shell, quartz, baked shale, and mica.

At Red Valley, Dr. Cross found the bannerstones in caches, and I quote her description:

Of paramount interest are caches containing bannerstones or material which seems to have some bearing on the bannerstone complex. All of these were of considerable depth, in most cases resting on or in the white sand. Although the soil over these caches appeared undisturbed, no true pit outlines were discernible and in four cases "red veins" ran over the objects. The caches were scattered throughout the excavated area without regard to plan and, with very few exceptions, the objects contained therein were unbroken, and exhibited unusually fine workmanship. They did not vary in type and material from the same kind of objects found scattered throughout the excavation or in refuse pits.

The descriptions of caches which follow the above quotation notes that in each cache the objects were surrounded by reddish-brown sand.

At this site, also, plain stemmed and side-notched points predominated, but Dr. Cross notes in passing that the triangular points found seemed to be concentrated and were about three inches nearer the surface than were the other types. Plain stemmed spear or lance points were present; small scrapers were abundant; and the grooved ax, celt, gouge, adz, cylindrical pestle, hammerstone, net sinker, rubbing stone, anvil, hoe, semi-lunar knife, and pendant are included in the trait list. Pottery is of the simple Woodland type; vessels are wide-mouthed, straight-sided, and mineral-tempered. Fragments of European pipes were found, but their association with the Indian artifacts is not clear.

It is of further interest that Linton and Hawkes also found this peculiar bannerstone cache trait at the Coens-Crispin Site in New Jersey.

In her conclusions, Dr. Cross has, with some reservations, integrated Red Valley with Dr. Ritchie's Early focus of the Coastal aspect and Rosencrans Ferry with his Late focus.

Dr. Mary Butler of the University of Pennsylvania Museum, excavating in the lower Hudson Valley, has also found sites which may be assigned to the Early and Late foci of the Coastal aspect. Some of the components of the Late focus produced pottery of both Iroquoian and Woodland types, and were further characterized by a large quantity of projectile points of triangular form. At one site, thought to be of the Early focus, the bannerstone and the semilunar knife were present.

As we compare the work of these various archaeologists, it becomes increasingly apparent that the Ford site has definite affinities with the Coastal aspect. Yet it differs from the better-known components of New Jersey and New York, though it links with one site in the lower Hudson area in the occurrence of a large

number of triangular-shaped projectile points. Except in the matter of shape of projectile points, the Ford site conforms to the general pattern of the Coastal aspect with startling clarity. The absence of the grooved ax at the Ford site corresponds with a similar absence at the Rosencrans Ferry site in New Jersey. Of significance is the bannerstone complex, noted by Cross and by Linton and Hawkes, present at the Ford site.

The writer's conclusion is that we have in the Ford site another component of the Coastal aspect, demonstrating that this complex is present, as expected, in southern New England. If this culture existed contemporaneously with European contact in this area, it should be termed the Late focus of the aspect. The presence of traits from the Early focus is not too surprising; the persistence of early traits seems to be a common occurrence in New England. The high frequency of triangular projectile points is also a feature which might well be expected here in contact times, as the great influence exerted by Iroquoian culture upon contemporaneous cultures in New England has long been recognized.

Attleboro, Massachusetts
February, 1946

THE MACON EARTH LODGE

CHARLES H. FAIRBANKS

INTRODUCTION

OCMULGEE National Monument lies on the left bank of the Ocmulgee River at the eastern edge of the city of Macon, Bibb County Georgia. A general description of the archaeological remains has appeared in a previous publication.[1] The present report will describe the excavation of a ceremonial earth lodge uncovered on the Macon Plateau and will summarize traits found in earth lodges represented in the Macon Plateau focus. As this represents the earliest earth lodge so far reported in the southeast, the distribution and significance of the occurrence of this type of structure will be discussed briefly. No historical identification of the Macon Plateau focus can be made, but some parallels with southeastern ceremonial will be pointed out.

The Macon Plateau is a maturely dissected peneplain rising from 75 to 100 feet above the river bottom. Near the eastern and western sides it is cut by two small streams which drain to Walnut Creek, a sluggish stream forming the southern border of the plateau. The underlying soil is a red Eocene clay, grading downward into a mottled red-and-white "calico" clay. The upper portions of the red clay often consist of a reddish or brownish sandy loam which seems to be the result partly of weathering and partly of redeposition. Top soil, especially in the archaeological areas, is a brown aerated loam which has suffered extensive sheet erosion in recent years. Almost all of the land has been intensively cultivated for more than a century.

The Central of Georgia Railroad cuts through the area from east to west, separating the southern tongues from the northern body of the plateau. This northern part was designated Mound D plateau (1 Bi 3) from a large structural mound near the eastern edge. The central portion of the plateau is fairly level, rising slightly toward the north for a distance of about 1,000 feet from the railroad cut. At that point it falls abruptly to a small stream flowing southwest. This stream later turns south to form the western limits of the plateau. The eastern side is formed by another small watercourse and the slope is more gentle than that of the western side.

Excavation of the earth lodges was under the direction of Dr. Arthur R. Kelley, Chief of Party, Smithsonian Institution excavations at Macon. James A. Ford was in immediate charge of the excavation for most of the period of work on the Mound D lodge. Labor was provided under various projects of the Civil Works Administration and Work Projects Administration.

THE EXCAVATION OF THE EARTH LODGE

Walls, Floor and Fire Basin

About 200 feet southeast of the center of Mound D was a small mound or knoll 70 feet in diameter and about 3 feet high. It was covered

[1] Kelly, 1938, pp. 1-68.

with weeds and stumps but had been plowed extensively around the edges. The mound was domed and did not show a central depression. In the fall of 1934 an exploratory trench was started across the area and soon intersected a rising shoulder of red clay. As the center of the mound was approached, the red clay suddenly dropped away to form a vertical wall. The inner face of the wall was slightly burned. Horizontal stripping exposed a circular structure 42 feet in diameter surrounded by the remains of a low clay wall or mound (Fig. 21). This wall extended 13–21 feet beyond the floor. It remained to a height of 37 inches above the floor at the eastern side but of only 9 inches at the north, where plowing was most severe. This massive buttress surrounded the clay floor so as to give the building the appearance of being semisubterranean, although it was actually entirely above ground. The floor was covered to the plowed zone with mixed clay, charcoal, and fragments of burned clay. The slightly uneven floor of hard-packed slate-gray clay appeared to have been patched in several places with a blue-gray clay of different origin. There was no evidence that the floor had been burned except where charred roof timbers lay in contact with it. The floor was lowest just northeast of the center and sloped gently upward towards the periphery. Very slightly south of the true center was a circular fire basin 4.5 feet in diameter and 1.0 foot deep with flat floor and slightly sloping sides. This basin was surrounded by a rounded, raised curb 6–12 inches wide and 5 inches high. The curb was battered for a distance of about 3.5 feet on the western side, where two notches 6 inches wide cut through the curb to the floor level. On the eastern side another notch 6 inches wide also cut through the curb to the floor (Fig. 21). There was a layer of compact, gray ash 0.3 foot thick on the bottom of the fire basin.

Entrance Passage

East of the fire basin, two rounded pilasters extended inward 9 inches from the wall. They flanked an entrance passage 2.2 feet wide and 26.2 feet long. The floor of the entrance was hard-packed clay similar to that in the structure proper. The passageway had been banked with a buttress of earth like that which surrounded the rest of the building. Details of construction were accurately determined through examination of a fragment of wall 1.0–1.3 feet high which still remained. Along each side were charred remains of split posts 0.2–0.3 foot in diameter. Behind these, and evidently originally tied to them, were charred fragments of split-cane matting of an under-four-over-four weave. About 0.3 foot back of the split posts was a row of round post holes 0.3–0.4 foot in diameter. The earth piled against the sides touched these posts, and in many cases post molds extended upward in this buttress from the post holes in the floor. Between the whole posts and the cane matting were charred lengths of cane lying without any evidence of weave. Three slightly larger posts were set at each side of the external end of the passage.

Eagle Platform and Seats

Inside the structure, directly opposite the entrance, was a large, packed clay platform shaped to represent an eagle. It was 16 feet long, 14 feet wide, and 9–12 inches high. The head was towards the fire basin (Fig. 21). The shoulders were slightly grooved as if to represent feathers, and the beak was shown by a shallow groove. The eye was a typical "forked eye" sunk 0.1 foot into the head. Just above the eye, a small hole 0.1 foot in diameter and 0.5 foot deep extended vertically into the head. At a distance of 4.5 feet from the wall was a row of three shallow rounded depressions 0.6 foot wide and 0.3 foot deep. The center one was 1.5 feet long, the other two were 1.3 feet long. On either side of the platform and extending around the wall to the entrance was a series of seats, twenty-three on the northerly and twenty-four on the southerly side of the lodge. These seats were modeled on a clay bench raised 0.3–0.5 foot above the floor. Each seat was separated from the next by a low rounded curb 0.6 foot wide and 0.3 foot high. Each seat had, at the front, an oval depression similar to the three on the eagle platform (Fig. 21). The bench was slightly higher near the platform and lowest near the door. At two places on the front edge of the bench and at one place near the wall were found small post holes 0.6 foot in diameter.

Four very large post holes, 2.0–2.9 feet in diameter and 3.0 feet deep, in which the charred ends of large logs were found, mark the location of the main posts supporting the roof. It is tentatively considered that the three small post holes found near the wall represent repair posts put in after the building had been completed. They do not form part of the regular pattern of the larger posts and seem to be definitely intrusive into the floor.

FIG. 21

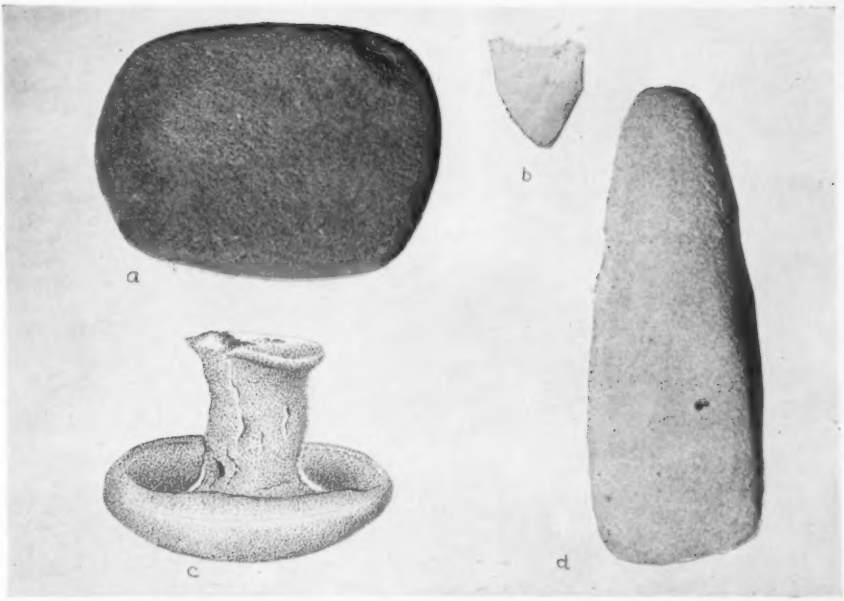
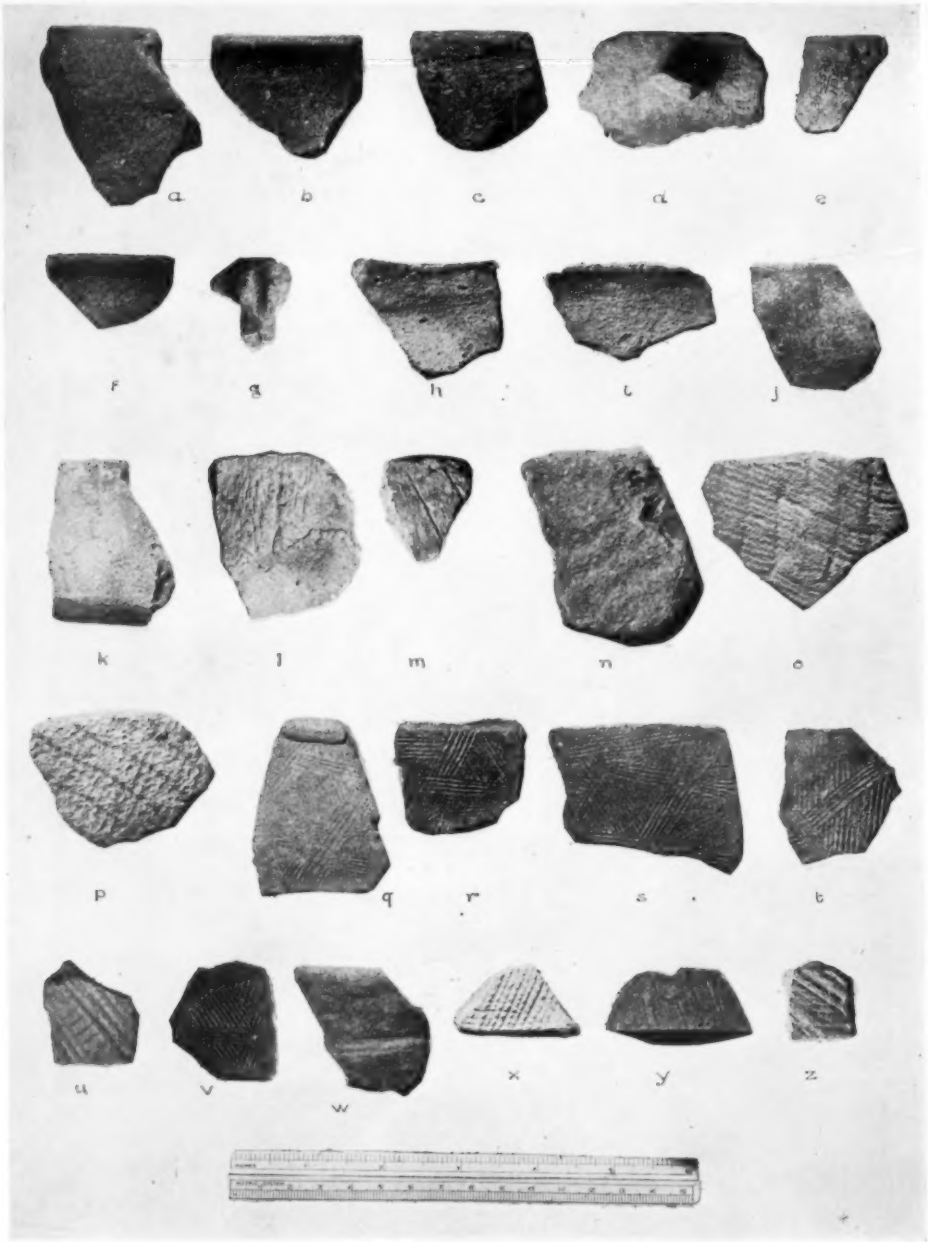


FIG. 21

a–d, artifacts from Mound D lodge: *a*, *b*, muller and quartz projectile point from sublodge humus; *c*, *d*, pottery trowel and celt from lodge period. *e*, excavated floor of Mound D lodge showing burned roof timbers, eagle platform at upper left, and seats along wall. Tile wall in background is part of temporary shelter.



Potsherds from the Mound D earth lodge. *a–p*, of the Macon Plateau complex: *a–k*, Bibb Plain; *l*, *m*, Macon Thick; *n*, McDougal Plain; *o*, *p*, Hawkins Fabric Marked. *q–z*, from humus band under Mound D lodge: *q–v*, Napier Complicated Stamped; *w–z*, Mossy Oak Simple Stamped.

Timbers

Upon the floor were numerous pieces of charred timbers resting on from 0.2 foot to nearly one foot of partly burned clay and fragments of charred cane (Fig. 21). Charred timbers, on the average 0.4 foot in diameter, lay on radiating lines around the central basin but did not reach within five feet of it. Thus, the charred remains of roof timbers resembled the spokes of a wheel with the fire basin as the hub. These timbers lay close to the floor near the wall and were elevated on fragments of burned clay near the center. Under the smaller poles were larger logs one foot or more in diameter. One of these touched the fire basin. It was evident that all these charred timbers represented debris from a burned roof and that the roof had been covered with earth. In burning, the cane had fallen first and allowed much of the covering clay to fall through to the floor before the main timbers burned sufficiently to give way. Thus, when these larger beams fell, they rested on previously fallen roof materials that had originally covered them. The fallen earth was a sandy red clay which contained lumps of bright yellow clay. On the floor between the platform and the fire basin was a thin layer of this yellow clay about 0.7 foot wide and fairly continuous for a distance of 7.5 feet. There was little charcoal at this point and the clay showed no evidence of burning.

Botanical Identifications. Specimens of the charcoal were identified by Dr. Volney H. Jones of the Ethnobotanical Laboratory, University of Michigan. The radial rafters were some species of the Southern Pine group. The resemblance to Longleaf Pine, *Pinus palustris*, was close, although there is a possibility that they were Loblolly Pine, *P. taeda*, or Shortleaf Pine, *P. echinata*. The large vertical posts were members of the White Oak series, some White Oak, *Quercus alba*, and others Post Oak, *Q. stellata*. In the absence of leaves and seeds, the cane could not be specifically identified except that it was either *Arundinaria macrosperma* or *A. tecta*. As both species grow in the immediate vicinity at present, either species, or both, could have been used.

Plan of the Structure

Measurement of the building disclosed that the circumference varied less than 0.5 foot from a true circle (Fig. 21). A number of additional instances of considerable accuracy were noted in the dimensions. The center of the middle depression on the eagle platform, the small hole in the eagle's head, the geometrical center of the building and the center of the entrance passage were all on a straight line. This line was 12°45′ south of east. An extension of the line for a distance of 66.3 feet passed directly between two post holes equally spaced on each side. The only connection between these two post holes and the structure which could be found was their position in relation to the central axis. The centers of the four large central posts marked the corners of a square measuring 18 feet on each side, but not truly parallel to the axis of the building. The sides of the eagle platform would, if extended, meet at a point on the central axis just inside the entrance pilasters. These measurements indicate considerable care in planning and erecting the building but do not seem to involve any but the very simplest mathematics.

Substructure Humus

Beneath the red clay surrounding the earth lodge was a band of humus 0.5–0.8 foot thick. The upper edge of this humus was, on the average, 0.3 foot below the surface of the floor. It extended to the edge of the red clay buttress, beyond which it was generally lacking, due to leaching and to recent cultivation. Northeast of the earth lodge, under Mound D, was a cultivated field, with rows of corn hills preserved by the mound fill. On this field have been erected two low rectangular mounds, 1.4 feet high, on which were the remains of two rectangular structures of the "small-log" type.[2] Under these mounds the same humus was preserved in the cultivated field. To the east and southeast, two extensive series of very large ditches or dugouts encircled the plateau.[3] Profiles definitely showed that these dugouts cut both the red clay of the earth lodge mound and the underlying humus. Thus there is good evidence that the earth lodge was older than the dugouts and that the two low mounds to the northwest were roughly contemporary with the earth lodge.

Pottery

Only one artifact was discovered directly associated with the earth lodge. That was part of a large pottery vessel lying on the floor near the northeast post. It is not available for description but, from the excavation notes, it seems to have been typical Bibb Plain of the Macon Pla-

[2] Webb, 1938, pp. 12–24, 192–194.

[3] Kelly, 1938, has a discussion of the dugouts and other plateau features.

teau pottery complex. The humus over the collapsed structure contained fifty-eight Bibb Plain (Pl. X), four Halstead Plain, and twenty Mossy Oak Simple Stamped sherds,[4] as well as one hundred nineteen modern glazed sherds. This is about the proportion of types expected for modern humus on this section of the plateau, except that no Ocmulgee Fields (Historic Creek) sherds were found. In the mottled red loam outside the red clay mound were sixty-two sherds; among them forty-seven Bibb Plain, one Halstead Plain, three Hawkins Fabric Marked, and two McDougal Plain—in all, fifty-three sherds or 85.5 per cent of the total—belonged to the Macon Plateau complex. Three sherds of Napier Complicated Stamped and four of Mossy Oak Simple Stamped (11.1 per cent) were referable to an earlier occupation. The remaining 3.1 per cent consisted of a single sherd each of Lamar and of an indeterminate incised type suggestive of the late Middle Mississippi wares and probably belonging to the Lamar period. These counts of sherds in humus and disturbed soils only indicate the multiple occupation of the plateau area.

The red clay of the mound contained eighty-nine sherds, of which eighty-one or 91 per cent, belonged to the Macon Plateau pottery complex. There were seventy-five sherds of Bibb Plain, four of Halstead Plain, and two of Macon Thick. Eight sherds—two Napier Complicated Stamped, five Mossy Oak Simple Stamped, and one cord-roughened—belonged to an earlier occupation. The general collections from substructure humus showed a distinct increase of older types, 17 per cent belonging to the earlier phase—twenty-six sherds of Napier Complicated Stamped and twenty of Mossy Oak Simple Stamped. The Macon Plateau complex was well represented by two hundred eighteen sherds or 83 per cent—one hundred seventy-nine Bibb Plain, sixteen Halstead Plain, two Macon Thick, two Hawkins Fabric Marked, and nineteen McDougal Plain. Three pits were present in this humus band, the pottery of which is as follows:

	No. of sherds	Percentages
Pit 87		
Bibb Plain	32	
Hawkins Fabric Marked	2	
Macon Thick	1	
Total Macon Plateau	35	70
Napier Complicated Stamped	9	
Mossy Oak Simple Stamped	6	
Total early	15	30
Pit 88		
Bibb Plain	42	
Halstead Plain	9	
McDougal Plain	1	
Total Macon Plateau	52	89.5
Mossy Oak Simple Stamped	4	
Napier Complicated Stamped	2	
Total early	6	10.5
Pit 91		
Bibb Plain	5	
Halstead Plain	2	
Total Macon Plateau	7	63.6
Mossy Oak Simple Stamped	2	
Swift Creek Complicated Stamped	2	
Total early	4	36.4

The pits did not extend to the top of the humus band but seem to have been dug from various levels during the accumulation of the humus. The small but significant percentages of Napier Complicated Stamped and Mossy Oak Simple Stamped indicate an occupation by the people or peoples responsible for these wares, followed by a fairly long occupation by the Macon Plateau group. The presence of sherds of both pottery complexes suggests that the pits were dug by the earlier groups and not completely filled by the time the site was occupied by people responsible for the Macon Plateau wares. That the structure was built some time after the first settlement by the latter is indicated by the high percentage of Macon Plateau types in the submound humus and in the mound itself; possibly the earth quarry was in an occupied area of the village. Most probably the earth was collected from the immediate vicinity, with the consequent inclusion of village debris.

Artifacts

Two triangular quartz blades were found in the substructure humus. These are of the type generally associated with the Mossy Oak Simple Stamped pottery. A small muller with slight depressions on each face, also from the lower humus, is quite similar to mullers from Swift Creek sites, approximately contemporary with Napier Complicated Stamped. This muller measures 10.7×8.0×2.9 cm. and is rather well shaped from an unidentified dark igneous rock.

During the excavation of the footing ditch for the protective shell for the restoration of the

[4] Named pottery types have been described in the Southeastern Archaeological Conference News Letter and in Fairbanks, N. D.

earth lodge, two artifacts were found in the upper level of the humus. They are considered to belong to the period of construction of the building, although they are not associated with its use. A gray diorite celt (Pl. IX, *d*) is 15.1 cm. long, 5.5 cm. wide at the bitt, 2 cm. wide at the poll, and 3.8 cm. in maximum thickness. The sides as well as the rather blunt bitt are convex. At a third of the distance from poll to bitt there are shallow notches in the sides. The sides are rough, but the faces are ground smooth. The same type of celt was found with Macon Plateau burials at Mound C. The other artifact was a small pottery trowel 4.6 cm. long with a head 6 cm. in diameter. The end of the handle forms a flattened knob. While pottery trowels are uncommon in Macon Plateau, this specimen is identical in paste characteristics with Bibb Plain pottery and must have been made by the same people.

Stratigraphic Position

In the humus under the earth lodge there were artifacts and pottery of Napier Complicated Stamped, Mossy Oak Simple Stamped, and Swift Creek Complicated Stamped types. The remains gave evidence of a short occupation by peoples who made these types. At Mossy Oak and Napier sites these occupations were separate and "pure." But at Swift Creek and other small sites, pottery of all three types is usually mingled. All three are roughly contemporary and the collections here indicate either a single occupation by a group using all three types or three small separate occupations. I am inclined to consider that the small hunting groups of the early period occupied the site in rapid succession.

In the same band of humus were remains characteristic of the Macon Plateau component. All evidence points to little or no lapse of time between these occupations, though no cultural contact can be demonstrated. The earth lodge was not built immediately after the arrival of the newcomers, as shown by Macon Plateau sherds below the clay buttress which formed the wall. At some time after the construction of the earth lodge, the extensive series of trenches were dug. The fact that these dugouts are very close to the entrance suggests that the earth lodge had collapsed before they were dug. The earth lodge and the rectangular "small-log" structures to the northwest were approximately contemporary, though erosion has somewhat obscured the connecting profiles. The possibility that the substructure pits indicate that the early occupation was by a group using all the pottery types is recognized. But in other sites there is no mingling of Macon Plateau and earlier material. The pits were probably not completely filled by Macon Plateau times and thus received some late midden material.

OTHER CIRCULAR EARTH LODGES

Mound D Lodge 2

Seven hundred feet west of the first earth lodge a second, similar, structure was discovered. It had been partly plowed away, but enough remained to give all the essential details. It was 30 feet in diameter with an entrance passageway 20 feet long to the east. The central fire basin and three or four central posts were found. A wall or buttress of yellow clay surrounded the blue-gray clay floor. The structure had been burned, as was indicated by the charred remains of roof timbers and burned parts of the fallen roof material. No seats or effigy platform were present. The pilasters flanking the entrance passage were like those in the first earth lodge, and charred fragments of a similar matting were found along the passage walls.

Mounds A and B

Between Mounds A and B, at the southern edge of the plateau, an area 150 feet square had been built up to a depth of six or seven feet by superposition of successive structures. In this small area were at least two rectangular structures and six circular buildings with some evidence of two or three additional circular features. The whole situation is similar to the juxtaposition of circular and rectangular buildings at Mound D. The circular structures will be described briefly, for comparison with the first lodge at Mound D. The excavation in the area of Mound A was not completed because priority was given to other work. For this reason, the structures will not be described thoroughly until a later report.

Mound A lodge 1. The first lodge excavated was 28 feet in diameter, with a surrounding clay buttress, and had been covered with earth. Four large central posts were present, as were a few smaller posts which may represent replacements or repairs. A central fire basin and a short entrance passage, 3.5 feet long, were found on the southwest side. The most radical variation was that peripheral posts 0.5 foot in diameter were set in a wall trench. These posts were spaced about 1.0 foot from center to center and

were immediately inside the encircling bank of clay. The footing ditch showed breaks at the external basal and internal upper edges as if considerable strain had been put on the upright posts. This structure was probably earlier than Mound A lodges 2 and 3, but later than the others at Mound A.

Mound A lodge 2. Lodge 2 was built of posts set in a circle 25 feet in diameter. The posts were 1.0 to 2.0 feet from center to center and averaged 0.5 of a foot in diameter. There was no wall trench or exterior clay bank. No central fire basin or other internal features could be found. This lodge was the latest of the Mound A group.

Mound A lodge 3. Lodge 3 was also constructed by setting posts 0.5 foot in diameter singly, without a wall trench, about 1.0 foot on centers to form the wall of a building 32 feet in diameter. Entrance was through a simple break without external passageway, in the wall on the western side. The fire basin was northeast of the center. No evidence of earth roof mantle or external buttress could be found. There were at least six principal central posts, the greatest number observed in any lodge at Macon. Lodge 3 seems to have been built after lodge 1 and before lodge 2.

Mound A lodge 4. Lodges 4 and 4*a* were closely superimposed, almost exactly above lodge 5. Lodge 4 was the highest, with 4*a* immediately below; lodge 5, at the base, was separated from the others by a thin layer of clay fill. They are all older than lodges 1, 2, and 3. Evidence of another structure was seen below lodge 5, but nothing can be said about it until further work is done. None of these three lodges was completely excavated, but test trenches indicated the basic data. Lodge 4 was 40 feet in diameter with posts 0.5 foot in diameter set about 1.0 foot apart in a wall trench. The central basin was present but there was no evidence of seats or external clay bank. It was definitely determined that it had been covered with a fairly heavy mantle of earth, but there was not sufficient evidence to indicate whether or not it had burned. No entrance passage was found in the small amount of test trenching completed on these structures.

Mound A, lodges 4a and 5. Lodge 4a was 40 feet in diameter and had a central fire basin, an external bank of clay, and peripheral posts set in a wall trench. In addition it had a row of seats along the wall. These seats had partitions and oval receptacles at the front similar to those in the first earth lodge. Lodge 5 was also 40 feet in diameter and had a central fire basin and external clay bank. There were no peripheral posts. Seats similar to those in lodge 4*a* and lodge 1, Mound D were present along the wall. In this case the oval receptacles were filled with a pure white clay. Lodge 5 most closely resembles lodge 1, Mound D, except that no entrance passageway was found.

Brown's Mount Lodge

About five miles southeast of Macon Plateau a limestone ridge is thrust out into the river plain. It is locally known as Brown's Mount.[5] and is the site of a small village yielding pottery of the Macon Plateau component. Investigation revealed a collapsed, earth-covered, circular structure. It was 40 feet in diameter and contained a central fire basin. Seats with oval receptacles were found next to the external clay wall. An entrance passage 21 feet long extended out from the structure in an east-northeast direction. Opposite the entrance was a fairly extensive area of white clay on the gray clay floor. No central or peripheral posts were found. The whole building had been damaged by plowing and no definite outline of the white clay area could be determined. It seems, however, to be comparable to the platform in lodge 1, Mound D. A small structural mound with the remains of a building also exists at Brown's Mount but has not been thoroughly investigated.

SUMMARY OF EARTH LODGES OF THE MACON PLATEAU COMPONENT

A tabular summary of the nine circular earth lodges follows. The average diameter is slightly over 35 feet, but the diameter of over half of them is 40 feet. Fire basins were found in eight structures, in seven of them, at the center. Only four had seats, but when seats were present they were always of the same type. In two of the three earth lodges that were completely excavated and that were not greatly damaged by plowing, the space opposite the entrance was given special treatment; in one, a platform was built there in the shape of an eagle, in the other, an extensive area of white clay was found opposite the entrance. The entrance was more often toward the east, but one was toward the west and one toward the southeast, so that position within the village rather than compass direction may have been the determining factor. The

[5] Kelly, 1938, map, p. 3.

number of central posts seems usually to have been four, although more were found in one of the later examples at Mound A. Evidently the usual method was to rest the outer ends of the rafters on the clay wall. In later forms, a circle of posts reinforced or replaced the clay buttress. Wall trenches were sometimes present, but these need not have been connected with an arched roof construction.[6] However, the fact that the clay buttress was present along with the wall trenches suggests that it, rather than an arched roof, may have exerted the pressure of which evidence was found. It is certain that such a large mass of clay would exert an inward pressure on wall members. The method of constructing the roof of the Brown's Mount lodge is completely unknown. Three of the structures were burned, one was definitely not burned, and in the others there was no evidence. The burning may or may not have been intentional.

Feature	Mound D-1	Mound D-2	Mound A-1	Mound A-2	Mound A-3	Mound A-4	Mound A-4a	Mound A-5	Brown's Mount
Diameter	42′	30′	28′	*ca.* 25′	32′	*ca.* 40′	*ca.* 40′	*ca.* 40′	40′
Peripheral posts	None	None	In wall trench	Singly	Singly	Wall trench	Wall trench	None	None
Buttress	X	X	X			X		X	X
Central posts	4	3	4 plus		6 plus				None
Position of fire basin	C	C	C		NE side	C	C	C	C
Seats	X						X	X	X
Special area	Eagle platform								White clay
Earth cover	X	X	X	?	?	X	X	X	X
Burned	X	X	No	?	?	?	?	?	X
Entrance length	26′	20′	3.5′		0.0				21′
Entrance direction	E by S	E	SW		W				ENE

From the evidence of these nine earth lodges we may suggest some of the developments that took place at Macon. The early form of earth lodge had a central fire basin, peripheral seats with receptacles, entrance passage, external clay bank, and four central posts. Possibly a diameter of 40 feet and orientation of the entrance toward the east could be added as early features. Later peripheral posts were added and seats with receptacles were abandoned. Finally, posts set singly were used without clay buttress. There also was a progressive shortening of the entrance passage from a length of over twenty feet until the entrance became a mere opening in the wall without external passageway. Diameter decreased from 40 to 25 feet. As peripheral posts set singly replaced the clay buttress, the number of central posts increased. Circular shape and possibly the existence of a special area opposite the entrance seem to be characteristic throughout. The earth cover seems to be as definite a trait as circular shape. The circular earth lodges were adjacent to rectangular ceremonial buildings and to structural mounds.

The "Forked" Eye

Modeled in the head of the eagle platform in lodge 1, Mound D, was a typical example of the "forked eye." This is an element characteristic of the Southern Cult,[7] and has been described from a number of sites in the Southeast. It usually occurs on copper gorgets, shell gorgets, or pottery. It has not been described as a feature of structures at any other site. The Macon Plateau component is definitely Middle Mississippian but is far less flamboyant than most

[6] Webb discusses wall trenches as an evidence of arched roof construction. Webb, 1938, pp. 47–48, Fig. 19.

[7] Waring and Holder, 1945, summarize the traits that belong to the Southern Cult.

related complexes. The pottery is definitely drab and is never incised as is typical Middle Mississippi. One plain shell gorget, a large green stone spud, a fragment of copper gorget, a bowl of conch shell, and discoidal stones are the only instances of "cult objects" discovered among tens of thousands of sherds and artifacts so far recovered. Thus the single instance of the forked eye stands out more definitely than do similar instances at Etowah, Moundville, and Spiro. The point to be made here is that Macon shows far less cult material than the other sites do. The Macon Plateau site is a large metropolitan type of village and in size is the equivalent of the others. Thus the lack of material is due to some cultural fact rather than to size. Two explanations are possible. First, the Macon Plateau people may have done all their art work on wood. This would not be foreign to known southeastern traits. But on all other sites where they are found these art elements are usually abundant and associated with pottery which is at least partly decorated. Secondly, the people responsible for the Macon Plateau component may have just begun to use the symbol and may not have integrated it thoroughly into their society. In that case, the eagle with the "forked eye" might be a true cult symbol, reserved for the ceremonial building and not yet the artistic property of potters and shell carvers. In the eyes of the writer, all the evidence points toward a group who had the basic ceremonial referred to as the Southern Cult but who had not yet developed the wide associations and uses of its symbols. They also may not yet have begun to use the other elements usually found associated with the cult, such as the bilobed arrow. The writer thinks the stratigraphic and artifactual evidence suggests that the people responsible for the Macon Plateau component were a migratory group who invaded the Southeast already in possession of the basic elements of the cult. There is good evidence that the groups who produced the elaborate art work of Etowah combined the traits of Middle Mississippi with traits that are much older in Georgia, such as paddle stamping as a decorative technique for use on pottery. The Macon Plateau people, then, came to Macon and erected earth lodges in which at least one element of the Southern Cult was used. The greater number of the elements was not used or had not yet become part of the cult. In the next period, Lamar, the durable cult objects became more numerous and varied. Also in the Lamar period, there developed a fusion of Mississippi Valley traits with ancient southeastern traits like stamping.

This fusion of two elements, and probably peoples, may account for some of the vigor of the Southern Cult. The fact that it was in this one instance carried, in an early and simple form, by a migratory group may illuminate the seemingly rapid spread of the cult over the Southeast. What its origins are I do not know, but I think the Macon material demonstrates that it did exist in a simple form at a time level earlier than its greatest elaboration and that it did not spring fully developed into the life of the southeastern Indians. Only in a later period was it to permeate the whole life of the region.

The Basins

Lodge 1 in Mound D, lodges 4*a* and 5, in Mound 4, and the Brown's Mount lodge all had seats arranged around the outer wall. At the front of these seats were shallow oval basins whose use is not apparent. They are very clearly not auxiliary fire basins, as they show no evidence of burning. They do not show the abrasion or wear which would be expected if they were foot rests. Yet their presence in four cases and the similarity of all of them indicate that they had a definite place in the earth lodges. A possible explanation is suggested in the use of the Black Drink by the southern Indians. This was widely used by all or most of the southern tribes in historic times and can be presumed to have some antiquity.[8] The tea was prepared from the leaves of the Cassine Holly (*Ilex vomitoria*). It contains caffeine and probably was habitually used for the stimulating effect. However, it always had sacred connotations. For ceremonial occasions, the cassine leaves were mixed with other herbs, willow bark and Button Snake-root, etc., producing a strong emetic. This was drunk at all important ceremonies and probably at public debates as well. It was drunk from cups of conch shell. There is, of course, no direct evidence that the Black Drink was used by the Macon Plateau people. However, a conch shell dipper was found with a Macon Plateau burial at Mound C. If we assume, on the basis of the wide southeastern distribution of the trait and the presence of the shell cup at Macon, that the emetic drink was in use, we have one possible explanation of the

[8] C. L. Swanton, 1928, pp. 547 ff., for a discussion of the Creek medicines.

receptacles. They would thus be vomitive basins used in connection with the ceremonial drink. The fact that the receptacles in Mound A lodge 5, were filled with white clay does not throw much light on their use. But at least the explanation that they were vomitive basins does not violate any archaeological facts. And it certainly does add color and "atmosphere" to the historical reconstruction.

CHRONOLOGY

Macon Plateau Focus

The evidence of associated artifacts and the profiles indicated that the circular earth lodge was a fairly early trait of the Macon Plateau focus. No typological development can be shown at the Brown's Mount component, but at Macon Plateau a suggested change was seen. It is found to precede the dugout series at Mound D and to extend down to a considerable depth at Mound A. Before considering comparable structures in the Southeast, the chronology of the Georgia area will be briefly reviewed.

Chronology in Central Georgia

The earliest levels so far excavated in central Georgia are characterized by low, domed mounds, an abundance of rather heavy, stemmed projectile points, and various styles of stamped pottery. Swift Creek focus and Napier focus seem to be the work of separate groups, and, while Mossy Oak does occur as a pure site, it more often is associated with the other two. The fiber-tempered pottery that occurs alone in northern Alabama[9] and on the Georgia coast[10] has not yet been found as a separate entity in central Georgia but usually occurs associated with the Swift Creek and Napier complexes. Swift Creek Complicated Stamped pottery is characterized by elaborate curvilinear stamped designs; Napier Complicated Stamped, by rectilinear designs. Good stratigraphy for these two has not yet been found. Both groups were apparently small and many sites show mixed remains of both complexes. This may be the result of approximate contemporaneity plus the occupation of many sites for short periods of time. Mossy Oak Simple Stamped pottery is roughly similar to the widespread cord-roughened types of the Atlantic coast. It is, again, associated with heavy projectile points. Sites where Mossy Oak Simple Stamped pottery occurs alone are known, but in other cases it seems to be found as a minority type associated with pottery of Swift Creek and Napier styles. It is felt that all three represent separate groups but that combinations do occur. Swift Creek Complicated Stamped is part of the Weeden Island complex in northwest Florida and southern Georgia.[11]

The Macon Plateau focus is represented by two components at Macon Plateau and Brown's Mount. It is characterized by structural mounds, circular earth lodges, rectangular buildings near or on mounds, shell- and grit-tempered pottery, and burial traits which show some similarity to the early Adena complex.[12] The closest relationships are to the Small-Log Town House described by Webb from the Norris Basin.[13] It is early and antedates the fusion of Middle Mississippian and southeastern traits that is characteristic of the next period. It is tentatively considered to be the last pre-Columbian group in central Georgia.

The Lamar focus has a much wider range of variation than any of the earlier groups and, as stated before, represents a fusion of two traditions. The complex is characterized by structural mounds, palisaded villages usually in river bottoms, elaborate pottery pipes with human faces, complicated stamped and incised pottery, some negative painting ("dog pots"), and, on some sites, the elaborate shell work of the Southern Cult. In central Georgia, it is identified on documentary grounds with the Lower Creek towns of the period from 1540 to about 1650, when it gradually develops into the fully historic Creek occupation identified with the Ocmulgee Fields focus. In pottery traits aside from stamping, Lamar shows the incised collars on cazuela bowls, strap handles, and other decorative techniques of late Middle Mississippi.

The Ocmulgee Fields focus is known from many well-documented sites from the late seventeenth and early eighteenth centuries. It is characterized by absence of structural mounds and the presence of small triangular projectile points, incised and "brushed" pottery, European trade materials and frontally deformed skulls. The pottery, especially, shows stylistic developments out of Lamar, and there can be no doubt of their genetic relationship. Many

[9] Webb, 1939; Webb and De Jarnette, 1942.
[10] Claflin, 1931.
[11] Willey and Woodbury, 1942.
[12] Fairbanks, N. D.
[13] Webb, 1938, Sites 2, 4, 5, 6, 8, 9, 17. See also Griffin on the pottery in the same volume.

sites are, in fact, midway between Lamar and Ocmulgee Fields.

Dendrochronology

Specimens from the Mound D earth lodge form a "floating chronology," as determined by Gordon R. Willey. Samples were sent to the Dendrochronological Laboratory of the University of Chicago but have not yet been tied in with the southeastern master chart. The fact that both the oak and pine used in the earth lodge are dateable in the southeastern charts promises that exact dates will eventually be available.

DISTRIBUTION OF THE EARTH LODGE

Irene Rotunda

Caldwell and McCann report the excavation of a circular ceremonial building at the Irene site, near Savannah, Georgia.[14] This building was 120 feet in diameter with five concentric circles of posts set in wall trenches. There was no evidence of an earth cover and its roof was presumably thatched. There were no large roof supports besides the concentric walls. The entrance was a seven-foot break in the wall. Burials were found near the center. It belonged to the Irene ceramic period, which is equated with the Lamar period. It is thus somewhat later than the Macon earth lodges. It seems to agree in all essential details with the Creek rotunda.

Chickasaw Rotunda

James Adair, the trader who spent a number of years among the Chickasaw, described their winter or "hot house" in some detail. It was built with four center posts, a circle of peripheral posts, entrance passage, and central fire basin. Beds were placed around the wall, and the outside was finished with wattle and daub. In addition, Adair says that the floor was usually sunk a yard or so below ground surface. The ceremonial building was similar, but larger.[15] Adair also mentions rectangular houses for summer and round houses for winter use among the Chickasaw and Choctaw. The type of circular house he described seems to be very similar to the earth lodge except for the substitution of wattle-and-daub for the earth mantle. Peripheral posts instead of the flanking clay wall were used on the Macon Plateau in relatively late structures. Rectangular and round houses are typical of many southeastern tribes. Swan describes the same type of circular house and, in addition, mentions a broad circular seat attached to the walls.[16] Other references indicate that this circular band of seats was a consistent feature of all circular houses, whether domiciliary or ceremonial.

Northern Florida

An interesting circular structure was described by Jonathan Dickenson, who traveled through northern Florida and coastal Georgia in 1691. Two structures at Santa Cruz and St. Mary's, both in northern Florida, were circular "warehouses" or public buildings. Little information is given about the supporting timbers, but a square smoke hole and encircling bench are mentioned. These were apparently a sort of communal building, because the bench against the wall was divided into "cabins" or sleeping compartments. One building was 50 feet in diameter, the other 81 feet.[17] These may well be similar to the "public granary" illustrated by Le Moyne.[18] This structure has many of the basic features of the earth lodge, but its walls were apparently wattle-and-daub and it appears to have had a thatch roof and large open doorway. The examples cited by Dickenson and Le Moyne are interesting because they carry the circular structure farthest to the southeast. They probably represent marginal late variations.

Cherokee Rotunda

Bartram visited the Cherokee town of Cowe in 1776 and described the circular temple there. It was built with three concentric circles of posts and a single large central post around which a spiral fire was built. Between the concentric rings of posts were placed benches or tiers of seats. The walls and roof were thatched and covered with a thin mantle of earth.[19] Bartram also illustrated a Creek town in 1789 which has a very similar structure.[20] The outstanding features of this type of building were the single central post and spiral fire. These seem to be special developments. The use of three concentric rings of posts is more typical of the circular structures in the Southeast

[14] Caldwell and McCann, 1941, pp. 30–31.
[15] Adair, 1775, pp. 417–421.
[16] Swan, in Schoolcraft, 1851, pp. 265–266.
[17] Dickenson, 1811, pp. 90–93.
[18] Ronciere, 1928, Plate 22.
[19] Bartram, 1792, pp. 336–337.
[20] Bartram, 1853, pp. 51–53.

where a circle of posts supported a wattle-and-daub wall.

There are numerous descriptions of Cherokee and Creek town houses from about 1760 to 1800 by a number of writers. Timberlake[21] says the Cherokee town house at Chote was of wood covered with earth and had an entrance passage, smoke hole, and peripheral seats. He does not definitely state the shape, but it was presumably round, as were other Cherokee town houses of the same period. Schneider[22] reports a circular town house for the Overhill Cherokee in 1783, but does not give details. He seems to indicate that both rectangular and circular houses were in use by the Cherokee of that period. Only the circular form is mentioned as a ceremonial building or town house. Most of the writers mention a winding passage to prevent drafts. This must be a late development, as it is not present in the early form, in which the entrance passage was always straight.

Creek Rotunda

Hawkins[23] describes a Creek "Tcokofa" at Kasita as having eight central posts. The radial rafters, peripheral posts, and seats are present in the usual form. The walls, and possibly the roof, were of wattle-and-daub construction. Besides having the unusual eight central supports, this structure was roofed with clay and pine bark instead of the common cane and grass thatch. The spiral fire was also present in this building.[24]

Tunica Rotunda

In addition to mention of the rectangular and circular houses of the Chickasaw by Adair, we find descriptions of circular houses among the Tunica in 1700 by the Jesuit, Gravier.[25] These were residences of small size which lacked a smoke hole but had a central fire, small entrance, and peripheral seats. These seats were raised on a wooden framework. There was a sacred area set off from the rest of the building. Thatch, without clay daub, seems to have been generally used along the Mississippi.

Deasonville Round Houses

In the same general region along the Mississippi River, archaeological evidence points to circular houses at a comparatively early date. Collins[26] found circular houses at the Deasonville site in Yazoo County, Mississippi. Structures 40–60 feet in diameter are indicated. Peripheral posts were set in wall trenches. Single central posts seem to have been used, as well as other interior posts whose arrangement varied considerably. These auxiliary posts may have supported furniture. Fire basins were located either centrally or towards the side. In at least one case there seems to have been an extensive entrance passage. The archaeological evidence here points to a comparatively early use of the circular structure in the Southeast. These structures cannot be considered the prototype of the earth lodge, but are rather a marginal development from an earlier common form.

Caddo Semisubterranean Structures

West of the Mississippi, ethnological evidence is lacking, but Harrington[27] describes earth-covered dwellings with long entrance passages. He identified these remains with the Caddo occupation of southwestern Arkansas. The shape and internal features seem to vary considerably, but the structures as a whole represent a marginal and late variation of the earth lodge.

Carolina Earth Lodges

In North and South Carolina, considerably north of the circular structures reported by Dickenson, earth lodges are reported from two sources. Circular houses plastered with clay are described by Ruidiazy Mendoza[28] for an unidentified tribe in South Carolina. Mooney reports similar houses for the Eno, Soccoree, and Adshusheer of North Carolina.[29] Whether all the features of the ceremonial earth lodge were ever present in that area is unknown, but these instances indicate a spread nearly to the coast of circular residences derived from the basic earth lodge type.

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[21] Timberlake, 1765, p. 32.

[22] In Williams, 1928, p. 261.

[23] Hawkins, 1848, pp. 71–72.

[24] Mr. James Y. Brame, of Montgomery, Alabama, writes me that he had excavated part of a circular structure on the Tallapoosa River that was 98 feet in diameter. His photograph shows clearly the bases of the large peripheral posts. He did not find any internal features. James Y. Brame, personal communication, February 15, 1946.

[25] Kenton, 1927, Gravier Relacion of 1701.

[26] Collins, 1932, pp. 2–12, Figs. 1–3.

[27] Harrington, 1920, pp. 70–81, 256–258.

[28] Mendoza, 1893, p. 478.

[29] Mooney, 1894, p. 63.

Southeastern Distribution

Thus the earth lodge is seen to occur in some form or in structures derived from the earth lodge from northern Florida and North Carolina on the east to the Mississippi on the west. If Harrington's semisubterranean houses are included, the range is extended to southwestern Arkansas. The Overhill Cherokee in the Little Tennessee were the most northern users of the circular rotunda and among the Creeks it apparently extended to the coast in Georgia and Alabama. This is nearly all of the region generally described as the Southeastern Woodlands. The Muskogean groups and Cherokee were the principal tribes in historic times and it is precisely among these that the rotunda or "hot house" is found. Archaeological evidence at Macon and Deasonville suggests, however, that the earth lodge is older than these groups in the Southeast. Some suggestion that it is associated with the Southern Cult was found at Macon.

TYPOLOGICAL DEVELOPMENT

A typological development at Macon has been suggested. This may be characterized by an increase in the number of central posts from the original four and the substitution of outer wall posts for the earlier buttress of clay. The use of multiple circles of posts, wattle-and-daub walls, single center posts, and spiral fire all seem to be marginal developments on the central theme as illustrated at Macon. In the center of the area, among the Creeks, the use of a rectangular "summer house," or of a rectangular arrangement of the public square, in conjunction with the circular earth lodge or "winter house" is strongly reminiscent of the rectangular and circular groupings found on the Macon Plateau. The fact that this grouping was associated with the religious practices of the Creek Confederacy strongly suggests the retention of an old form.

The following table summarizes the various features of the main types of earth lodge. The various cases are identified by tribe or location.

METHOD OF DIFFUSION

A number of explanations of the origin and distribution of the earth lodge are possible. Linton[30] reviews the distribution of the earth lodge in the Southeast, the Great Plains, and on the West Coast and its possible connections with the kiva of the Southwest. He believes the association of the earth lodge with the pottery-agriculture base in the Plains points towards the lower Mississippi Valley. He also points to the constant use of grass thatch under the earth mantle, a southern trait, as additional evidence of a southern origin. The known movements of the Arikara and Mandan into the Plains point to them as the agents of introduction. Linton sees the lodge carried northward "by tribal movements rather than solely by diffusion."[31] This theory seems to fit all the available evidence quite well.

The Macon earth lodge, however, may shed

[30] Linton, 1924, pp. 247–257.
[31] *Ibid.*, p. 257.

	Macon	Irene Rotunda	Chickasaw (Adair)	Cherokee (Bartram)	Creek (Hawkins)	Florida	Deasonville
Cover	Earth	Thatch	Wattle	Earth	Wattle	Wattle	Wattle ?
Fire central	X	X	X	X	X	X	X
Entrance passage	X		X	X	X		1
Number of center posts	4		4	1	8	?	1
Peripheral bank	X						
Peripheral posts	Late	X	X	X	X	X?	X
Extra circles		X		X			
Sacred area opposed entrance	X		X*		X*		
Peripheral seats	X		X	X	X	X	
Smoke hole	X		X	X	X	X	
Season used	?		Winter	Winter	Winter		

* Among the Creek and Chickasaw there was apparently no specially prepared sacred area, but there was preferential seating. Those of highest rank sat opposite the door.

more light on the distribution of the earth lodge in the Southeast. The Macon Plateau focus, as previously indicated, is the product of an early Middle Mississippi occupation. Its closest relationships seem to be with Middle Mississippi aspects in eastern and western Tennessee.[32] The high cultures of Marksville and Coles Creek in the lower Mississippi Valley do not seem to be ancestral to this aspect and the circular earth lodge is not found in either of those aspects. The Macon earth lodge, in other words, seems to be derived from the Tennessee area rather than from farther south. The facts that it has not been reported from earlier levels in central Georgia, and that the Macon Plateau focus is obviously intrusive into the area, suggest that the people responsible for this focus introduced the earth lodge. Tribal migration, rather than gradual diffusion, seems to have been the method of introduction into the Macon area. At present, the Macon earth lodge is typologically and stratigraphically the earliest instance of such a structure in the Southeast. The lack of earth lodges of the basic four-post type in the lower valley of the Mississippi and the relationships between the Macon Plateau focus and manifestations to the northwest rather than to the west are significant. This suggests that the earth lodge may have entered the lower Mississippi Valley at about the same time as it was introduced into Georgia. The center of diffusion would then be an intermediate point, possibly in western Tennessee. The fact that no really early or ancestral form has been found probably means that the whole complex was introduced into Georgia in a developed stage. Its typical association in the southeast with rectangular structures, as complementary dwellings or "temples," further strengthens this assumption. It is suggested that, in the Georgia region at least, the earth lodge represents a ceremonial structure complex introduced simultaneously with the first fully agricultural system. The group may also have carried the Southern Cult in rudimentary form. It continued, with modifications, as a ceremonial unit until the loss of aboriginal culture by the southern Indians. Its center of diffusion was probably in the lower half of the Mississippi basin. It represents a special variation of an older, basic type of earth lodge that was spread over most of North America. It seems to have been carried into both the Plains and Southeast by the migration of an agricultural group, or at any rate at the same time as the introduction of maize agriculture.

[32] Webb, 1938.

RESTORATION

The burned and collapsed earth lodge at Mound D, Macon Plateau, presented an unusual opportunity to visualize the architectural details. The ethnological material adequately supported the archaeological data. It was decided to rebuild the upper parts on the original remains. Under the direction of James A. Ford, National Park Service Architect James T. Swanson, Jr., and Engineer Olinus Smith designed and constructed a concrete shell which would protect the reconstructed building.[33] Artificial light which is provided simulates a daylight effect. Ventilation is also provided to reduce humidity. The original clay parts were treated with a 6 per cent solution of nitrocellulose (Alvar) in acetone to prevent dusting. The completed restoration is one of the chief exhibits at Ocmulgee National Monument and appears to be reasonably permanent.

[33] Work Projects Administration Project No. 5449.

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Ft. Frederica National Monument
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February, 1946

EXAMPLES OF PHONETIC CONSTRUCTION IN MAYA HIEROGLYPHS

N. CORDY

EARLY attempts at the decipherment of Maya hieroglyphs by using the phonetic approach were ill-advised, and as a consequence the phonetic theory was generally discredited. However, in view of the fact that the nonmathematical glyphic texts are largely unread, the general reaction to the total ideographic point of view was unjustified. Because we cannot read these texts and know little of the origin of the various signs, any statement of the proportion of ideographs to the total number of signs would appear premature.

Since the time of the earlier writers upon the subject, S. G. Morley in 1915 reintroduced the subject of phoneticism, expressing his belief that phonetic construction was used to some extent in Maya writing.[1] In 1931 I implied my belief in the phonetic origin of certain signs.[2] In 1933, the late B. L. Whorf advanced the thesis that the Maya hieroglyphs were basically phonetic.[3] While I cannot go this far with Mr. Whorf and believe that some of his examples were not happily chosen, I do find myself in agreement with him concerning certain glyphs, and I believe that, as we learn to understand the glyphs, more and more phonetically constructed signs will be revealed.

Before proceeding to the explanation of supposed examples of phoneticism it would be wise to define what constitutes a phonetic glyph. The simplest definition would be: "A phonetic glyph is a sign which, apart from its original pictographic or ideographic value, conveys a sound only and not any inherent idea." But, from my study of the Maya hieroglyphs, this definition appears to be far too simple, too bare. I think that there are instances in which the function of a certain glyph is primarily to convey a sound, but, where there are a number of homophones to choose from in a particular case, that homophone glyph which is ideologically related to the subject treated would be the preferred sign. For example, the Maya word for the pronoun "his" is *u*. In the codex texts this seems to be generally represented by the mouth-picto-

[1] Morley, 1915, pp. 26–30.
[2] Cordy, 1931.
[3] Whorf, 1933.

graph derivative, Landa's first *u*.[4] But the word *u* also means collar. The Maya Death God characteristically wears a collar. Consequently certain signs pertaining to the Death God are preceded, not by Landa's *u*, but by a pictograph of the Death God's collar. (See Fig. 38, *a*.)

Another qualification of our definition may be stated thus: A certain ideograph, though still carrying its original idea-association and its original sound-value, may have been written so long in combinations with very old phonetic elements that in the mind of the scribe the sound-value and not the idea-value predominated. Such may be the case in the signs for *katun* (*tun*) and *likin* (*kin*). That such an assumption may be true is strongly argued by the variant glyphic spelling *lakin*, discussed later.

One more point before we leave the subject of definitions—and this concerns the shackles which European alphabetic spelling has placed upon the thought modes of those who study Maya: it has been argued that Landa's *ca* in *katun* cannot possibly be phonetic because Yucatec *c* and *k* represent different sounds. One is tempted to say, "There it is; the Maya wrote it that way. Is a better explanation offered?" One is reminded of the individual who, upon seeing his first camel, exclaimed, "There ain't no such animal!" Of a certainty, the Maya do distinguish between the sounds represented by *c* and *k*, but it does not follow that they made the distinction in glyphic writing. In this connection, Whorf, following Swadesh, says that "the series of glottalized stops is not only systematically distinguished from the simple stop series, but also systematically connected with it."[5] Evidently the Mayas considered that their *c* and *k* sounds were close enough to be represented by the same characters in glyphic writing. One must remember that they possessed no such handy analytical tools as our present-day scientific phonetic alphabets, in which we, too, recognize the closeness of these two sounds by using the characters *k* and *k'*—the same letter with only a diacritical mark to distinguish between sounds.

A final word on modern letters: In looking for phonetic constructions one should not be deterred from an otherwise promising identification by the barrier of present-day spelling. Such modern spellings as *ch*, *tz*, and *x* may in some cases hark back to the same original sound or, from the Maya point of view, may have been close enough in sound in the early days of glyphic writing before the later divergence of lowland Maya tongues. Compare, for example, the words for monkey: the Yucatec *maax*, the Kekchi *watz*, and the Quiché *batz* (*m*, *w*, *b* and *x*, *tz*), or the Yucatec *chen* and the Tzeltal *tzun* (*ch*, *tz*). Examples involving other letters could be cited. Also, there exist in Yucatec Maya two sets of vowel equivalences, *a-i* and *o-u*; *a* replaces *i* and *o* replaces *u* in the alternative spelling of many words. So much for the ground work; let's have a look at the glyphs themselves. The figures used are after Maudslay, Morley, Gates, and Beyer.

THE COMPOUNDS OF LANDA'S *Ca*

The most famous of these is, of course, the *katun* sign (Fig. 22), glyphed generally as two opposed *ca* signs resting upon a *tun* and flanking a *Cauac*. The *Cauac* here is double writing and has the ideographic value *tun*, as elsewhere at times. This very fact reinforces the belief that the real *tun* sign is used phonetically here and the *Cauac* is merely an ideographic determinant; else the glyph might be misread as *katun*, "war." Morley gives good evidence that the *ca* sign is derived from the pictograph of a fish, *cai*, which in the inscriptions sometimes replaces it.[6]

FIG. 22

In the sign for *Lahca*, "twelve," from Stela F, Quirigua[7] (Fig. 23), the lower jawbone, which is used in the numerals between ten and twenty to express the concept "ten," is compounded with *ca*. Here enters the possibility that the entire series of head numerals may be phonetically constructed. The word *lah* means "cease, die"; and of course the lower jawbone (and the skull of numeral ten) is an apt ideograph. But is there any connection between the Maya concept of numeral ten and death? Did the Maya think of ten as the end or death of the simple numerals? If they did not, the numerical use of the lower jawbone is in all cases phonetic, as it *may* be here in any case. Certainly the *ca* is phonetically used, and the construction of a glyph only half phonetic would seem incongruous to me.

FIG. 23

Tzec (Fig. 24). The superfix is *ca*. The main sign is *Chuen*. *Tze* and *chu*(*en*) may be from the same archaic root (*tz* and *ch* equivalence). The

FIG. 24

[4] Gates, 1937, p. 83. See also Whorf, 1933, frontispiece.
[5] Whorf, 1935, p. 378.
[6] Morley, 1915, pp. 65–66.
[7] Maudslay, 1902, Vol. 2, Pl. 40.

glyph reads *Tze-ca*. It may be, as Whorf thinks,[8] that some late Maya words have lost a final vowel, or the Maya may have attained true alphabetic writing in some instances. This analysis of the month name *Tzec* was performed independently by both Whorf and myself.

FIG. 25

Mac (Fig. 25). The codex form of *Mac*, one "hand" of Land's *ma* over *ca*, giving *ma-ca* or *Mac*. In 1933, Whorf published this finding, which accorded with my own observations.

FIG. 26

I have above mentioned the possibility that the head-numerals may be phonetically constructed. The head-numeral for 8 certainly is. J. Eric Thompson[9] observed that the head-numeral 8 was the head of the Maize God (Fig. 26). The Maize God is *Yum-Xac*, "Lord of the Sowing." "Eight" in Yucatec Maya is *uaxac*. But this word can be resolved into *ua-xac*, "bread-sower," an apt appellative of the Maize God, hence the use of his head for numeral 8.

FIG. 27

Figure 27, *a*, from the Dresden Codex,[10] shows a form of bar-and-dot numeral 8 which occasionally replaces the glyph shown in Figure 27, *b*. Figure 27, *b* is an ideograph derived from the face of the Maize God bearing a vertical line as seen in the Perez and Madrid codices. Our Figure 27, *a*, shows a reversal of the process seen in Figure 26. There the Maize God stands for *uaxac;* here *uaxac*, 8, stands for some part of the verb *xacah*, "to sow." In combination with *caban* it gives *xac-cab*, "sown earth."

FIG. 28

Lakin, a variant of *likin*, "East" (an *a-i* equivalence as previously mentioned). The glyph shows a double bar 10 over a *kin* sign. Figure 28, from Stela A, Copan,[11] is proved to be the sign for "east" by the presence of the glyphs for "west," "south," and possibly "north" in the same block of four glyphs. An abbreviated *kin* disk has been built onto the lower bar, obviating a mistaken reading of 10 *kins*. This sort of thing has been called double writing, though it may not really be that. But what is the real function of the infixed *kin?* It is true that such a device prevents a misreading, but just how was it intended to work? It may be a mere graphic device, an auxiliary ideograph, showing that the idea expressed by the double bar 10 was not in this compound separable from the idea of which the *kin*-sign proper conveyed only a part. On the other hand, the infix may have a phonetic value. The common word for "east," *likin*, is etymologically *lik-kin*, from *likil*, "to rise." So, in an *a-i* equivalent spelling, the archaic verb would seem to have been *lakal* and the word *lakin* would properly be *lak-kin*. Thus our Figure 28 may have been constructed, the infixed *kin* standing for the letter *k* of *lak*. It was probably chosen in preference to other *k*-signs because of its ideological relationship to the sun idea inherent in the concept "east." If the above is true, then two-thirds of the glyph (*la* and *k*) has been shown to be written phonetically. Again, I say that it would seem out of place for part of a word to be written phonetically. I believe the entire sign to be phonetic. If the Maya could use the first *kin* phonetically, then it is quite possible that they used the second *kin* in the same manner, though in this case retaining its full syllabic value. Syllabic phoneticism would seem, evolutionarily speaking, to precede alphabetic phoneticism. If the above form for "east" is constructed phonetically, then we have presumptive evidence that the more common form is so constructed. I must point out that the accompanying sign for "west" also bears an infixed *kin* in the superfix. This may have been done for artistic correspondence with the "east" sign. Or it may indicate that the root expressed by the *Manik*-hand is not *chi* but *chik*, in the same manner that the "east" sign yields not *la* but *lak*. All this may seem very complex, but we have to consider all possible angles if we are to begin to understand the logic and mechanics involved in glyph-building.

Throughout the codices are isolated bar-and-dot numerals serving as coefficients of glyphs. A god mentioned in Maya mythology is one known as *Ah Buluc Balam*. In Maya art, the jaguar, *balam*, is sometimes represented with a water lily; i.e., the jaguar is in the water. *Buluc* means "eleven," but it also means "submerged in water." And if we sometime discover a glyph of the jaguar preceded by the numeral eleven it will not necessarily mean a calendric sign. We are reminded of the striped-faced god of the codices who carries the coefficient eleven. At any rate it is demonstrably untrue that "the

[8] Whorf, 1933, p. 10.
[9] Thompson and Gann, 1931, p. 214.
[10] Gates, 1932.
[11] Maudslay, 1902, Vol. 1, Pl. 30.

text here becomes inconveniently calendrical and non-linguistic for the translator," as one writer puts it.[12] Numerals are glyphs and are used as other glyphs are, either as ideograms or phonograms, and the examples given above prove just that.

KIN COMPOUNDS

FIG. 29

Likin and *chikin*, "east" and "west" (Fig. 29, *a*, *b*). These two signs were early cited as examples of phonetic construction and this explanation was attacked by the ideographic school on the ground that the *kin* part of the two words was portrayed by the sun, *kin*, ideograph and that, inasmuch as the idea "sun" (sunrise, sunset) was concomitant with the ideas "east" and "west," these two signs were not phonetic but ideographic. Neither case is proven. The two signs may be half phonetic and half ideographic, but this would be an awkward type of construction. Indications are that the Maya used auxiliary ideographs with phonetic signs, as in *katun* and *ma yam*, but whether or not it would have appeared logical to the Maya to use two elements of equal value (as here), one phonetic and one ideographic, we do not know. The superfix of *likin* is *ahau* (inversion does not appear to affect the value of the glyph) *Likin*, as previously indicated, was probably originally *lik-kin*, from *likil*, "to rise." I had thought that the word *ahau*, "lord, ruler; the one elevated to the mat and the dais," was derived from the verb *ahal*, "to rise," but Gates, says that *ahau* is *ah-au*, "he of the milpa."[13] The first supposition favors an ideographic solution of the "east" glyph, as *likil* and *ahal* are synonyms. But Gates' derivation of *ahau* favors a phonetic solution, only here the word becomes not *likin* but *ahal-kin*, as suggested by Seler.[14] As to *chikin*, the superfix is the day-sign *manik*, and Whorf suggests a possible archaic word for "west," *man-kin*, "sun's passing."[15] The word *chi* means "mouth; to bite, to eat" (Whorf gives "rest" also), which ideas all apply to the west as the region of sunset—where the sun is eaten by night; where the sun rests. But Seler's explanation of *manik* as a sign for "to eat"[16] is naïve to say the least. The sign given him by the Indians in the Huaxteca was merely the universal beckoning gesture with the fore finger. It has no necessary connection with eating. And the true rendition of the *manik* superfix may be *chik*, not *chi*, as indicated at the close of my explanation of Figure 28. So, until someone can read the signs for "east" and "west" better than they have been read so far, phoneticism is an open question. For emphasis, as above indicated, the glyph-written words for "east" and "west" may not be the commonly accepted *likin* and *chikin*. Certainly, in the glyph for "south" the word expressed is not the commonly given *nohol*, but its exact synonym *ma yam*.

It may be well to digress here somewhat, since we have touched upon the subject of the *manik* glyph and especially since a number of very strained etymologies have been proposed for the word *manik*. Now, as before noted, the *manik* hand-sign appears to represent the syllable *chi* of *chikin*, *chi* meaning "mouth," etc. And it is to be noted also that hand-signs and mouth-signs mutually replace each other in various codex glyphs for "north" and "sky." In my 1931 article on the day-names, I did not attempt to determine the meaning of the word *manik*, but interpreted the obvious grasping character of *manik*, linking it with maize culture. Now I present two words which may have some bearing on the meaning of the hand-sign, viz., *manikah*, "siembra segunda vez";[17] and *nikah*, "menear de uno a otro lado lo sembrado."[18] Both these definitions relate, it will be seen, to seed-sowing.

MA-COMPOUNDS

FIG. 30

We have already spoken of Landa's double *ma* form in discussing the codex form of *mac*. One inscriptional form of *mac* consists of double *ma* over a fish pictograph (Fig. 30). We have previously seen, in discussing the *katun* sign, that the *ca* element is sometimes replaced by a fish, *cai*. Inasmuch as the *ca* element seems to be derived from the representation of a fish, it might well be that the fish pictograph also holds at times the phonetic value *ca*. The possibility, in the light of the known *a-i* equivalence in Yucatec Maya, that there may have been an archaic word *caa*, meaning "fish," also presents itself. Whorf published his findings on *mac* in 1933. However, Gates calls the single *ma* form "*mac*"[19] an identification which is not

[12] Long, 1936, p. 315.
[13] Gates, 1931, pp. 53, 54.
[14] Seler, 1904, p. 30.
[15] Whorf, 1933, p. 37.
[16] Seler, 1904, p. 30.
[17] Reference mislaid.
[18] Pérez, 1866–1877.
[19] Gates, 1931, p. 68.

borne out by the evidence. At any rate, the double *ma* form in *ma yam* has the value *ma*. A word as to the makeup of the single *ma* sign. When it occurs without the *ca* sign it has been called "combination of day Imix and day Ahau."[20] The ahau sign, upright or inverted, abbreviated or full, occurs as the infix at the top of the sign both in *ma* alone and in *mac*. Hermann Beyer has proved that some three-spot signs are abbreviated *ahaus*.[21] But we cannot be sure that the body of the glyph is *imix*, i.e., that the *ahau* infix replaces the black spot of *Imix*, for there are at least two other glyphs whose lower parts resemble the lower parts of *Imix*. Incidentally, I should like to add that the glyph shown in Figure 31 is apparently a lenticular variant of *ma*. A one-quarter rotation of the three-spot infix converts this glyph into the common *ma* sign. However, Landa gives this sign the phonetic value *l* and *le*.

FIG. 31

The uinal *mac*, according to Landa (Fig. 32). The top element is the double *ma* sign, and the bottom part is a variant for *ceh*, "deer." (See superfix of uinal *Ceh* on Stela 2, Copan.)[22] The combination gives us *ma-ceh* for *mac*.

FIG. 32

Ma-yam, "south" (Fig. 33). This discovery was announced by me in 1936.[23] The glyph consists of double *ma* over *yax* with (at times) six half-circles, which, in the article cited, I regarded as ideographic determinatives for the meaning of *ma*, here "earth." The *yax* glyph stands for the word *yam*.

FIG. 33

Kan, "MAIZE" AND *Kan*, "YELLOW"

The most distinguishing feature of the day sign *kan* (Fig. 34) is the undulating line. When one compares the representations of rattlesnake rattles in Maya art,[24] there will be seen a close resemblance between this feature and the *kan* sign. Added elements are the bisected oval at the top and the three vertical lines at the bottom. One must remark here that the divided oval is replaced in some *kan* signs by two conjoined incisor teeth, a circlet, or an eye. The divided oval may represent the fangs of the snake and the three lines may portray the large ventral scales. In other words the *kan* sign would appear to be a glyphic synecdoche. As to the snake origin of day sign *kan*; "snake" in Yucatec is *can*, elsewhere *chan*. The rattlesnake is *ahau-can*, "lord snake, *the* snake;" hence the use of rattlesnake features in an original snake glyph. While the word *kan* does not now mean "maize" in any Maya language, the use of the *kan* sign in the codices to denote the maize grain is unmistakable and, I think, conceded by all Maya students. *Kan*, "maize," then is written by *can*, "snake." Here we have another *c-k* equivalence like the *ca* in the *katun* glyph. However, the identification of *can* with *kan* goes much further than this mere rebus-phoneticism. In 1933, I advanced the idea that the maize ear was the point of origin of the Feathered Rattlesnake.[25] A double row of kernels represented rattles; the green husk, the Quetzal plumes; and the silk, the beard of the Feathered Serpent. Hence we have an example of my first qualification of the definition of a phonetic glyph; the glyph could be purely phonetic and at the same time have an ideological relationship to the object which it represents.

FIG. 34

In Figure 35, we have a slight variant of day sign *kan*. However, it is not used as a day sign but as a *kin* sign.[26] We have, then, *kan* for *kin*. B. L. Whorf, in a communication to the writer, suggested that this was consonantal writing, but I am inclined to regard it as just another case of *a-i* equivalence.

FIG. 35

Kan, "yellow" (Fig. 36). As noted by Gates,[27] this glyph frequently stands for *kin*, "sun," though the reverse apparently is never so. In the explanation, Gates links the concepts "sun" and "yellow" ideologically and I think he may be right. In fact, the "yellow" glyph may be a very old variant of the sun sign, the use of which had become restricted by convention. Nevertheless, the use of *kan*, "yellow," for *kin*, "sun," may well be phonetic in exactly the same manner as *kan*, "maize," phonetically expresses *kin*, "sun," via the *a-i* equivalence.

FIG. 36

THE SO-CALLED *ben-ik* GLYPH

In my analysis of the glyph for "south" in *Maya Research*, as above cited, I demonstrated that it was sound procedure to go from one

FIG. 37

[20] Teeple, 1930, p. 71.
[21] Beyer, 1934, pp. 101–108.
[22] Morley, 1915, Pl. 21*a*.
[23] Cordy, 1936, p. 326.
[24] Maudslay, 1902, Vol. 1, Pl. 23.
[25] Cordy, 1933.
[26] Morley, 1915, p. 72.
[27] Gates, 1931, p. 95.

Mayance language to another in search of meanings lost in one or another of these languages. By this method I equated the two Yucatec terms for "south," *nohol* and *ma yam*. The *ben-ik* glyph acts as a superfix to glyphs which are the names or appellatives of gods and sacred animals who are, in reality, gods also. From this observation proceeded the belief that if the right-hand element of Figure 37 really was a form of *ik* (which I doubted) then Figure 37 might phonetically express *ben-ik*, possibly an archaic form of *uinic* or *vinak*, "man," metaphorically "lord." But Gates explains that de Rosny was in error in the *ik* identification.[28] Nevertheless, it was apparent that the so-called *ben-ik* expressed some word meaning "god" or "lord," and as further evidence came to light my conviction grew. In April, 1935, Hermann Beyer's article "The Date on the Long-Nosed Mask of Labna"[29] appeared. Among the text figures are some face glyphs for day-*ahau* from Yula. These very aberrant forms of *ahau* seemingly needed visual verification, for they carry *ben-ik* superfixes. Inasmuch as day glyphs are simple statements of day names, it seemed logical that the *ben-ik* was merely corroborative writing of the face-*ahau*, either spelling out the word *ahau* or some synonym which would suggest *ahau*. It remained only to find the expressed word. Now we know that the Quiché equivalent of day-name *ben* is *ah*. Hence the right-hand element, de Rosny's "ik," would seem to stand for *hau* or *au*. On page 53 of Gates' *Outline Dictionary of Maya Glyphs*, I found the statement that the word *au* is an archaic form of "cornfield" or "milpa" and that *ahau* is literally "he of the milpa." In my 1931 article on the day names I advanced the idea, following Förstemann,[30] that day-sign *Lamat* represented the planted field, the milpa. De Rosny's "ik," our "au," is found as the central element of some *lamat* signs. In fact, Beyer calls this element "lamat center."[31] Hence the so-called *ben-ik* sign is really *ah-au*, "he of the milpa," or simply *ahau*, "lord." Below, in Figure 38, I list a number of *ah-au* (*ben-ik*) compounds.

FIG. 38

Figure 38, *a* is the Death-God's glyph earlier alluded to in this article. Figure 38, *b* is the Sun God's glyph and reads *ahau-kin*, "lord sun." Figure 38, *c* is one of Beyer's Yula *ahaus* and is double writing of *ahau*. Figure 38, *d* is from page 4.c.8 Pérez Codex[32] and is double writing of normal-form *ahau*. Figure 38, *e* is rather interesting because it offers confirmatory evidence of our reading the *ben* sign as *ah*. It is Gates' O.G.D. No. 331.5[33] and is from the Madrid Codex. Here the *ben* is replaced by an *ahau* (compare Figure 38, *f*). We could read this superfix *ahau-au* in which the "au" would be double writing. But I think that from the etymology of the word *ahau*, here used as a direct replacement of *ben* (*ah*), we are justified in giving the *ahau* the phonetic value of *ah* in this case. In such names as *Ah Zinteyut Chan*, *Ah Mecat Tutul Xiu*, etc., the meaning "lord" (*ahau*) seems implicit in the word *ah*. Certainly in our biblical writing the capitalized pronoun "He" implies "Lord." The use of *ahau* for *ah* is only a reversal of this process. That such reversed processes do occur in Maya writing has already been shown in this article where *uaxac* stands merely for *xac*. Before quitting our discussion of *ben-ik*, I must remark upon the element "owl-plume,"[34] Gates' O.G.D. No. 609. This sign (see Figure 38, *b*) appears as an affix; the owl-plume seems really to be attached to the *ben-ik* rather than to the main sign, so the totality of combinations is really much less than at first appears. Other evidence which I will not present here indicates that the element under discussion has the phonetic value of *u*. So the combination *ben-ik–owl-plume* gives us *ah-au-u*, in which "owl-plume" double writes the final vowel of "au."

CAUAC

The day-name *cauac*. This word has no other present meaning in Yucatec Maya. But the corresponding and etymologically related words in other Mayance tongues mean "storm" or "rain." Förstemann thought that the Yucatec word *chaac*, "rain," came from the same root.[35] In fact, the *cauac* glyph (Fig. 39) was actually used to express *chaac*, for I have shown that the names of the four "cauac months" in Yucatec are properly *Chen Chaacil*, *Zac Chaacil*, etc.[36] *Cauac* would appear, then,

FIG. 39

[28] Gates, 1931, p. 95. [29] Beyer, 1935, p. 186.
[30] Förstemann, 1904, p. 561. [31] Beyer, 1930, p. 20.
[32] Gates, 1909. [33] Gates, 1931, p. 150.
[34] Beyer, 1935, p. 186.
[35] Förstemann, 1904, p. 566. [36] Cordy, 1940, p. 6.

to be an archaic word signifying storm or rain, and it is appropriately ideographed by a bank of cumulous clouds. But the *cauac* glyph was also used to signify "fire," in Yucatec, *kaak*. This is shown in a number of places in the codices, where the *cauac*-sign, prefixed by a flame-bracket and subfixed by the wood-sign, appears in the glyph of the Sun God (conceptually the great fire of the heavens) and elsewhere as a glyph for fire. Moreover, the Maya Bat God who was the Fire God, particularly of the Kakchiquels, whenever portrayed on the monuments, bears on his body the elements of the *cauac*-sign, because *cauac* is used glyphically to denote "fire."[37] Fire is shown graphically in the inscription-form *cauac*-sign by the picture of a flame from which sparks or glow radiate. The same flame-sign, triplicated, can be seen as the superfix to the fire stone, the flint in the Madrid Codex, 67.b.3, 67.c.3. Here in *cauac* we have a very good example illustrating some of the mechanics and thought-modes used in Maya hieroglyphic writing. At first it may seem very strange that one and the same glyph should be used to express two such, let us say, antagonistic ideas as rainstorm and fire. The answer is that while each element is an ideograph in its own right (clouds for rain, flame for fire), each in turn is a phonetic determinative of the other. Here, again, we run into the question of the glottalized and unglottalized stops. And the evidence again is that, while the Maya made such a distinction in speech, they did not do so in their writing. The words *cauac* and *kaak* were used to complement each other. Working from the analogy of the word *chaac* we might suppose that there is an earlier form which might be written as "caac" which resembles *kaak* more closely. It may have seemed very fitting to the Maya that rain and fire should be combined in the same glyph, for lightning, conceptually "sky-fire," is concomitant with storm and the words for "lightning" in various Maya languages seem to have been derived from the same root as *cauac*. Incidentally, we are reminded of *quiahuitl*, the Aztec equivalent of day-name *cauac*. *Quiahuitl* means, literally, "rain," but is sometimes translated as "fire-rain," bearing out our analysis of the *cauac* glyph as the sign for both "rain" and "fire."

Some apparent *cauacs* in the codices are perhaps not *cauacs* at all, but may be *cab*, *cabil*, "honey," pictographs. In the pictorial representations on the pages of the Madrid Codex concerned with beekeeping, honey is portrayed, not by a *cauac*-like glyph, but by a *caban* glyph. In other words, *cab*, "earth," phonetically spells *cab*, "honey."

[37] Cordy, 1940, p. 3.

THE ZAC-LIKE SIGN KUCH

Beyer's "Vulture Sign,"[38] (Fig. 40) sometimes appears as a prefix to pictographs of vulture heads. This procedure is double writing. "Vulture" in Yucatec Maya is *kuch*.

FIG. 40

The glyph does not appear to resemble a vulture in any way and seems to be related to certain knot-like signs such as *zac* (see the uinal *Zac Chaacil*). *Zac*, "white," appears to be ideographed by a knot of white cotton yarn. In the Motul[39] and Pérez[40] dictionaries, *kuch* has the additional meaning of "cotton thread." As used in the above-cited manner, the *kuch* sign acts as a phonetic determinative of a pictograph.

Figure 41 is used on pages 16, 17, and 18 of the Dresden Codex, in a number of cases where a bird or a person is carried on the head or shoulders of a goddess. Pérez[41] gives *cuch* and *kochah* as meaning "to carry on the head or shoulders." (These two seem to be really the same word; what we have here is an *o-u* equivalence such as found in *moan* and *muan*, *mol* and *muluc*, Tzeltal *molo* and *mulu* and various Nahuatl words.) We don't know what the main sign of Figure 41 means. It may express "head" or "to carry," or something else. But certainly our vulture-sign here expresses "to carry," "to bear." It may be double writing or it may not be. But its use in this case is likewise phonetic, and here again the distinction between glottalized and unglottalized stops fails to hold good in Maya writing. Moreover, if *cuch* and *koch* are really the same word, it would appear that the distinction between *c* and *k* was not always made in Maya speech.

FIG. 41

UINAL OR U?

Figure 42 illustrates the head form used in the inscriptions to symbolize the time-period of the second order in the Maya long count. This period has been generally referred to as

FIG. 42

[38] Beyer, 1930, p. 17.
[39] Martinez Hernandez, 1929.
[40] Pérez, 1866–1877.
[41] Pérez, 1866–1877.

"uinal," though Morley,[42] following Bowditch, inclines toward the designation "u" on phonetic grounds. This twenty-day period is, historically, merely a reformed month, in Maya, *u*, in the same manner that the tun of 360 days is merely a reformed year. Morley points out that this head-glyph and its full-figure variants represent a frog, in Maya, *uo*, here used for the sound "u" to express *u*, "moon" or "month." It hardly seems possible that the word *uinal* is expressed by our Figure 42, unless the mouth-curl and the dotted "ear" in some way complete the word. This seems unlikely, inasmuch as the full-figure variants sometimes lack these features. According to Landa, the term "u" was applied to a count of 30-day months, and the eighteen 20-day divisions of the year were called *uinal-hun-ekeh*. Now we know, from the account of the "Birth of the Uinal" in the Book of Chumayel,[43] that the series of twenty differently named days was known to the Mayas as *uinal*. It does not follow, as J. Eric Thompson supposes,[44] that *uinal* is the name of the thirteenth part of the *tzolkin*. We do not know that the Maya thought of these thirteen divisions as separate units. Thompson thinks that Landa's *uinal-hun-ekeh* was obtained by error and that it applies to the tzolkin and not to the year. It is quite possible that Landa was in error, but it seems to me that that expression is not the name of anything, but a phrase denoting a simple count of uinals which might run as follows: *uinal-hun-ekeh, uinal-ca-ekeh, uinal-ox-ekeh*, etc. I am reminded of material presented in Ernest Noyes' "Notes on the Maya Day-Count."[45] The *u* and the *uinal*, though both derived from the concept "month," belong to different orders. The *u* is a period marker, a mere place holder; one *u* is the same as any other, there is no individuality; one *u* succeeds another without a break. But the *uinal* marks a definite portion of the year, it carries traces of its seasonal origin and it is named. *Uinals* do not succeed each other indefinitely; their succession is broken by the five-day *uayeb*.

So much for the examples. Other probable phonetic constructions could be cited, but those given above are the best documented so far. Let us see what can be deduced from the glyphs above analyzed. By so doing we can find out why early attempts at phonetic interpretation have failed and we can formulate a code of procedure which may enable us to make better progress. To tabulate:

1. Phonetic construction began in early times. Examples: *can* and *cauac*, day-signs that lie at the very base of the calendar.

2. The distinction between glottalized and unglottalized stops, as exemplified by Yucatec *c* and *k*, does not hold good in glyphic writing. Examples: *ca-tun* for *katun*, *can* for *Kan*, *kuch* for *cuch*.

3. The use of the *ca-* element may indicate phonetic construction. Examples: *katun*, *lahca*, *tzec*, *mac*.

4. The use of "Copan *ceh*" may indicate a phoneticism. Examples: Landa's *mac*.

5. The use of *cai*, "fish" glyph, may indicate a phoneticism. Examples: Some inscriptional forms of *katun* and *mac*.

6. The use of a known ideograph to express a compound idea, in which the original idea is still inferred, does not rule out phonetic construction as a possibility; the scribe may have had the sound in mind rather than the simple idea. Examples: *katun*, *lakin*, and possibly *likin*, *chikin*.

7. The head-numerals may be phonetic; at least numeral 8 is. Example: *ua-xac* for *uaxac*.

8. Bar-and-dot numerals are used nonmathematically in phonetic construction. Examples: 8 for *xac*, 10 in *lakin*.

9. There are other numeral-forms beside bar-and-dot and head numerals. (We already know this from the use of the thumb for numeral one.) Example: *lahca* for 12 or, as in English, "twelve" for 12.

10. A single pictograph or ideograph may express a polysyllabic phoneticism. Example: Maize God's head for *uaxac*.

11. Double, corroborative, or determinative writing was employed:
   - *a*) Repetition of an already present element. Example: *-kin* in *lakin*.
   - *b*) Use of a synonymous ideograph. Example: *cauac* in *katun*.
   - *c*) Use of an ideograph with a strictly phonetic glyph. Example: half-circles in *ma yam*.
   - *d*) Use of a phonogram with a pictogram. Example: *kuch* with vulture-head.
   - *e*) Use of a phonogram with an ideogram. Example: *cuch* with "carrying-on-head-and-shoulders" glyph.

12. Some glyphs are polyphones, others pos-

[42] Morley, 1915, p. 71. [43] Gates, 1932, p. 40.
[44] Thompson, 1931, pp. 352–353.
[45] Noyes, 1935, p. 383.

sibly so. Example: *cai-ca-c; chuen-tze; cauac-tun; ahau-ahal-likil-ah; manik-chi; yax-yam; ben-ah; kin-k.*

13. An *o-u* equivalence is found in Yucatec Maya and Tzeltal. Examples: *mol* and *muluc, mulu* and *molo, muan* and *moan, cuch* and *kochah.*

14. An *a-i* equivalence is found in Yucatec Maya. This is reflected in the glyphs. Examples: *lakin* and *likin; kan,* "maize," for *kin; kan,* "yellow," for *kin.*

15. Some compound Yucatec words and, of course, their glyphs cannot be understood merely by the use of Yucatec Maya. Examples: For *nohol* one refers to *noh,* the Quiché-Kakchiquel equivalent of *caban.* For *ben* of so-called "Ben-ik," one refers to *ah,* Quiché equivalent of *ben.*

16. Duplication of sign does not necessarily affect its value. Examples: Two *ca-* in *katun,* two *ma-* in *mac,* two *ma-* in *ma yam.*

17. A phoneticism need not be exact. Example: *yax* in *ma yam.*

18. A glyph may be both phonetic and ideographic at the same time. Examples: *cauac,* the extra *kin* of *lakin.*

19. The same glyph, depending on the context, may be used to express separate ideas. Examples: *cauac,* used either for "rain" or "fire" and, probably, "stone."

20. A certain ideograph may be preferred to another in a specific phonetic construction where such an ideograph already possesses an ideological relationship to the object which is phonetically expressed. Example: *can,* (rattlesnake for *kan,* "maize," which had previously been symbolized as the feathered rattlesnake.)

21. The technique of infixation demonstrates —in some cases, at least—that the glyph carrying the infix acts as a modifier of the idea expressed by the infix. Examples: *lakin* and *chikin,* discussed in the text accompanying Figure 28; the pictorially expressed *zac-cab,* to be discussed under Figure 43.

22. Phonetic elements of a compound need not be in sequential order. Examples: Some *tzec's* and "ben-iks."

CONCLUSION

FIG. 43

Finally, from page 67 of the Dresden Codex, we present for comparative purposes, in Figure 43, a compound which, lacking any real evidence to the contrary, we must regard at this time as an ideograph. This is because both characters of the compound form still carry their original idea values in the compound idea represented by this polygenetic sign. And until we can amass sufficient evidence from other sources that the Maya scribe, in writing such compound signs, carried in his mind primarily the sound-value and not the idea-value of his glyphic tools, this and similarly constructed signs must be regarded as ideographic. When I first saw this sign I at once took it for a phonetic construction and read it as *zac-cab,* "white earth," having in mind only the sound-values of the two components. However, these two components do carry the separable ideas "white" and "earth;" in their own right they are ideographs. This instance illustrates the erroneous methodology employed in the earlier phonetic approach. For all sounds representing spoken words (outside of corroboratives and determinatives) must have spoken phonetic values, be they pictograms, ideograms, or phonograms. To return to our Figure 43, parallel pages in the Dresden Codex each contain a glyph which serves as a locative of the gods alluded to in these passages. Our Figure 43 is such a locative, for the particular passage here is illustrated by a picture of God B sitting in a "house" the floor of which is a *caban*-sign and the back wall and roof of which are a huge, bent *zac*-sign, infixed with *caban* elements. This technique of infixation demonstrates that the *zac* is "of the earth." Thus pictorially we have the same thing represented which our *zac-cab* glyph in Figure 43 stands for. In Yucatan today, *zac-cab* signifies a white earth found in pockets of the limestone and used as an ingredient of mortar. In the Pérez Dictionary we find *zac-cab* (Pérez gives *zahcab*)[46] is not only the word for "white earth," but also the hollow or cave produced by the removal of same—an instance of idea extension. Our Figure 43 is, then, an ideograph of *zac-cab,* "cave." This particular glyph has additional interest. It demonstrates that the phonetic approach can be used in the decipherment of some ideographs. It shows further that, while the Dresden Codex may not actually have originated in a limestone country, the author and his contemporary Maya readers must have been familiar with a limestone area. For a word *zac-cab* used with the meaning of "cave" could hardly have its point of origin in an area of igneous or clastic sedimentary rocks.

In this study I have presented twenty-two supposed examples of phonetic usage. Four of

[46] Pérez, 1866–1877.

them, *katun*, *u*, *likin*, and *chikin* have long been known, the last two being unproven cases. This leaves a residuum of eighteen examples, worked out by the present writer. Several of these, as previously noted, had been independently determined by B. L. Whorf. Certainly it must now appear that phonetic construction must play a very large part in the Maya glyphic system. And, if the present writer with his various limitations, including a very limited knowledge of the Maya languages, can produce so striking a result, then surely someone who really knows Maya should be able to make great progress in raveling our special problem. What has been needed heretofore has been a proper approach, a methodology, and a knowledge of the logic and mechanics of glyph-building. I hope that in this study I have provided a beginning for the true understanding of what the Maya hieroglyphs actually say.

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Los Angeles, California
January, 1946

THE DEEP CREEK REGION, THE NORTHWESTERN FRONTIER OF THE PUEBLO CULTURE

CARLING MALOUF

THE Deep Creek region is a pleasant Great Basin valley bordering the southwest edge of the Great Salt Lake Desert—that is, it is pleasant in contrast to the 10,000 square miles of stark desert which bound it on three sides. The Deep Creek Mountains, which attain an elevation of 12,101 feet, separate the valley from the desert proper. Two small streams, Fifteen-Mile Creek and Spring Creek, have their sources in these mountains and join at Ibapah, Utah, to form Deep Creek itself.

The proximity of this lofty though localized mountain range is responsible for an annual precipitation of 16 inches, which in times past permitted a relative abundance of flora, game animals, and birds. The Deep Creek Mountains

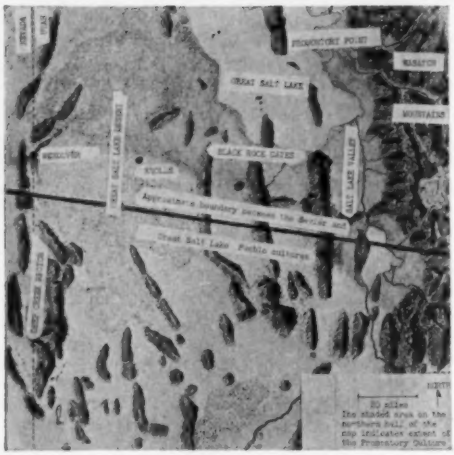
GREAT SALT LAKE
BLACK ROCK DESERT
SALT LAKE VALLEY
Great Salt Lake Pueblo culture
50 miles
The shaded area in the northern half of the city indicates extent of the Promontory Culture

FIG. 44.—Map of a portion of Utah showing approximate boundary between the Sevier and Great Salt Lake Pueblo cultures.

are granite and metamorphic formations, but in the north end of the valley there is an effusive lava flow where obsidian can be found. Abutting mountains also furnished primitive man in this region with limestone, quartzite, and marble for the manufacture of tools and implements.

A few hints on the archaeology of the Deep Creek region were offered by Reagan, who asserted that "the cliff-dwellers got this far north . . . they left their writings on the rocks and on the walls of their homes [alluding to caves] to attest to their having been there."[1]

Pictographs and petroglyphs are fairly abundant in the surrounding hills. In Tunnel Canyon, about thirteen miles west of the Deep Creek range, near Tippets, Nevada, there are several small groups of pictographs, most of which are painted in red (Fig. 45, *b*). The largest group is located in a small recess just 500 yards from the mouth of the canyon, but a few others are scattered up the canyon walls nearly to the summit of the range. Reagan had previously reported petroglyphs on a rock three-fourths of a mile east of the Goshute Agency Day School, and pictographs in the "basin" by Willow Springs Pass, six miles eastward. Other pictographs were reported by him to be in a cave on the headwaters of Choke Cherry Creek, in the Spring Creek Range, six miles southwest of the agency. The latter are painted in red, yellow, and blue.

Archaeological sites may be found along the banks of Fifteen-Mile Creek, along the headwaters of Spring Creek, and at the north end of Deep Creek Valley, where the stream passes through the mountains to die in the Great Salt Lake Desert beyond. An effort was made to discover sites between Deep Creek and Wendover, Utah, where a few pieces of Great Salt Lake Gray ware have been found in caves,[2] but the survey was unfruitful.

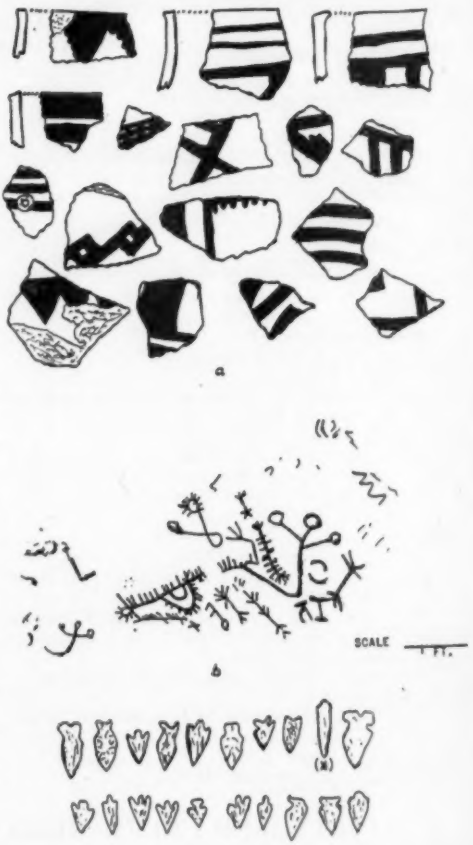

FIG. 45.—*a*, design elements on painted wares. Subsequent studies may prove that two wares, black-on-gray and black-on-white, are represented at Deep Creek; *b*, pictographs in red in Tunnel Canyon, Nevada; *c*, types of arrowheads found on surface sites at Deep Creek. Specimen marked X is a post-European metal point.

[1] Reagan, 1929, p. 115; 1934, p. 43.

[2] Caves in the vicinity of Wendover, Utah, some seventy miles north of Deep Creek, were being excavated at this time by Elmer R. Smith and Charles E. Dibble, of the University of Utah. To these two men may be attributed much of the credit for the success of my archaeological survey at Deep Creek.

Sites in the immediate vicinity of the modern Deep Creek Indian village appear to have been locations of temporary camps. No evidences of house types or shelters were revealed by testing; thus, it appears that the Deep Creek region in Pueblo times was a haven for hunting parties and raiders. Nevertheless, the presence of pottery, including Sevier black-on-gray ware, indicates a limited degree of permanency of the camps. Determination of a culture sequence at Deep Creek must await the excavation of caves, as open sites are not stratified. Points, knives, scrapers, and even pottery from several cultures in the sequence are jumbled together near the surface of the ground. Chronology can at present only be assumed for this area on the basis of typology.

Although numerous chips and points littered the ground on the west bank of Fifteen-Mile Creek, no pottery was found. Practically all the Pueblo pottery described in this paper came from the surface along the east bank of this stream. The sites extended from the Goshute Day School house to a point approximately one mile north, and were in a band not more than fifty feet wide. Occasionally, Pueblo potsherds were found along minor streams flowing into Fifteen-Mile Creek from the Deep Creek range. One such locality is apparently near the petroglyphs mentioned by Reagan as being "three-fourths of a mile east of the agency."[3]

Pottery from western Utah has been very inadequately described in archaeological literature. Even here a minute study is not promised, but at least a summary of the types found at Deep Creek is presented in order to show the relationship of this region to other parts of the Northern Periphery.[4] Unless otherwise indicated in the text, all of these descriptions are adopted from the original classification of western Utah pottery types proposed by Julian H. Steward.[5]

Great Salt Lake Gray. Paste is medium fine, but sandy, producing a friable vessel. Color is gray, but is occasionally tinged with brown, or is mottled with varying shades of gray. Temper is of fine quartz, sand, and a small quantity of biotite mica. The latter is inclusive in the tempering, but it is readily noticeable, despite the minute size and quantity of the particles, because of its high reflective qualities. Exteriors may be polished, but none of them seem to be floated. Sometimes the surface may appear cracked, or crackled. Interiors generally are striated with marks left by a smoothing implement. Firing is often uneven. After manufacture, vessels were badly burned during use as cooking pots. Three potsherds have fugitive red on the interior surfaces, and three others have it on their exteriors. Average thickness is 4.9 mm., with a range of 2.6–5.7 mm. Forms are globular, with necks of varying length. Short-necked ollas have outward-turning rims.

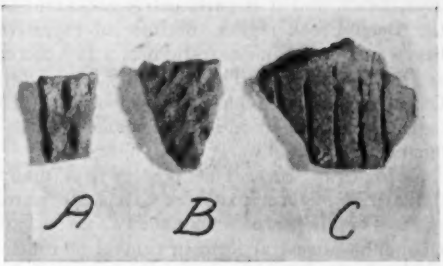

FIG. 46.—Potsherds from Deep Creek. *A*, so-called Great Salt Lake false corrugated ware; *B*, true corrugated ware; *C*, incised neck design from narrow-mouthed collared olla.

Great Salt Lake Buff. This pottery is almost identical to Great Salt Lake Gray ware, differing mainly in buff color (which appears to be a deliberate aberration), in its tendency to have greater proportions of quartz and silicates as tempering, and in its finer texture. It appears in fair quantities in sites in Salt Lake Valley, as well as at Deep Creek.

Knolls Gray ware. This pottery is basically like Great Salt Lake Gray ware in form and construction. Its distinction lies in its abundant mica tempering and in its very dark gray color. Surfaces are unslipped and unfloated, and mica shows through in profusion. Knolls Gray ware was first found by Julian H. Steward at Knolls, Utah,[6] but in such small quantity that it was not recognized as a separate subtype. Later, when additional pieces were found in Black Rock III Cave, on the south shore of the Great Salt Lake,[7] its right to distinction was recognized. It has since been observed at Wend-

[3] Reagan, 1934, p. 43.

[4] This article was read in manuscript by Florence Hawley, who made several suggestions which were incorporated into the descriptions of pottery. It is to be regretted that these suggestions had to be made without an opportunity to examine the collection. Any statements made within this article remain my own responsibility.

[5] Steward, 1936.

[6] Steward, 1936, pp. 8–9.

[7] Black Rock Cave No. III, excavated by a University of Utah party conducted by Elmer R. Smith and the writer, and later by Charles E. Dibble. The findings are recorded in Enger, 1942.

over, Utah, and it is particularly abundant in the Deep Creek region. Because of excessive heat experienced in domestic use, a few pieces are reddish in color. The collection from Deep Creek includes one handle, a specimen with fugitive red painted on its exterior, and a fragment of corrugated ware.

Sevier Gray ware. This pottery has many similarities in form to Great Salt Lake ware, and it is highly probable that the two wares had a common ancestral form in central or southern Utah. It differs from the Great Salt Lake ware in its paste, which is much firmer, and in its coarse black tempering of basalt, biotite mica in minute quantities, obsidian, and possibly chert. The temper is so coarse it projects through the surface, even though the pottery may be washed or floated. Sevier Gray ware may be easily divided into two distinct types:

a) Tempering large, abundant. Surfaces are usually floated or smoothed, and there is a crackled appearance.
b) Tempering is much finer, but the dark particles are still sufficiently large to project through the surface. Surfaces are smoothed but not floated or washed. Mica and ground sand may also be mixed with the predominating darker tempering.

A few pieces of both these types are striated on the interior, apparently as the result of use of a smoothing implement during manufacture. Southwestern archaeologists may recognize many similarities between this ware and Lino Gray ware, or Rosa Gray ware.

Deep Creek Buff ware. This pottery also resembles Great Salt Lake Gray and Great Salt Lake Buff in form. It is very distinctive in having a coarse silicate tempering and a cruder surface treatment. Some of these specimens resemble Shoshone ware to such a degree that it is impossible to distinguish between the two by means of potsherds alone. Rim pieces are distinctly Puebloan in form. Moreover, many other pieces are painted with fugitive red—a trait lacking among the Shoshone. Fugitive red pieces can be divided into the following classes:

Fugitive red on exterior: surface smoothed, firing good, fourteen pieces. Exterior smoothed only, interior striated, firing good, one piece.
Fugitive red on interior: striated exterior, firing fair, interior striated, one piece. Smooth exterior and interior, firing good, two pieces. Striated interior, smooth exterior, firing fair, one piece.
Fugitive red on both surfaces: smooth exterior and interior, two pieces.

Thus, it can be seen that fugitive red is applied most commonly to the Deep Creek Buff ware which is smoothed on both interior and exterior surfaces. Only in one instance does fugitive red appear on an unsmoothed surface. The collection of Deep Creek Buff ware includes one handle—another indication that it is Puebloan and not Shoshonean. Firing is about as thorough as that of Great Salt Lake Gray ware, but a little over half the collection is considered as having just "fair" firing. Two pieces have washed exteriors. Thickness ranged from 3.1 mm. to 10.9 mm., with an average of 5.1 mm., slightly greater than that of Great Salt Lake Gray ware.

Because of its scarcity in most other parts of the Northern Periphery and its relative abundance at Deep Creek, the term Deep Creek Buff ware is chosen for its designation. Some pieces may have incised body designs, but, without evidence of the forms from which they came, it is not possible to distinguish them from fragments of Shoshone ware.

Sevier Corrugated ware. Nineteen pieces of Sevier Corrugated ware are included in the Deep Creek collection. Exteriors are smoothed to varying degrees, with the majority of fragments having at least half the depressions obliterated by smoothing. The collection also includes three pieces of Great Salt Lake Punch ware, so typical of the Great Salt Lake region, but rarer farther south in Utah and southern Nevada. One of the latter potsherds bears part of the neck design of a large olla. Tempering consists of a mixture of basalt (or some other dark material), mica, and silicates. Interiors are usually smoothed and exteriors may be floated. One piece of this corrugated ware made with the ingredients of Knolls Gray ware, with its characteristic abundance of mica tempering, has also been found.

Sevier Black-on-gray. Julian H. Steward, in his original classification of pottery types in the Northern Periphery, remarks that "painted decoration in western Utah is restricted to black-on-gray, which usually occurs in bowl interiors, and to fugitive red on exteriors."[8] Examination of the Deep Creek collection makes it apparent that a division between black-on-gray and black-on-white is necessary, as backgrounds are of two distinct shades. The shade suggested here as "white" is practically identical with the "white" background on Mesa Verde and Kayenta wares. The gray shade, on the other hand, is a battleship gray. Tempering is usually of mica, silicates, quartz, and a rather dark substance—possibly basalt or chert—all of which are ground rather fine. The paste is also fine and firm and is gray in color. Firing

[8] Steward, 1936, p. 13.

is thorough and even. Surfaces are variously treated, the most common treatment being smoothing on exteriors and washing on interiors. Some Sevier Black-on-white pieces may be slipped. Designs are usually found on the interior surfaces of bowls. A study of forty potsherds of Sevier Black-on-gray and Sevier Black-on-white revealed the following:

Smooth interior, smooth exterior, three pieces. One of these has fugitive red on its exterior.
Washed interior, smooth exterior, seventeen pieces. Four of these have fugitive red on their exteriors.
Slipped interior, smooth exterior, one piece. This fragment has fugitive red applied on its rim as well as on its exterior surface.
Floated interior, smooth exterior, ten pieces. Of these, one has fugitive red on its exterior and another has it on the interior.
Interior washed, exterior floated, two pieces.
Interior floated, exterior floated, four pieces.

The average thickness for all Sevier Black-on-gray and Sevier Black-on-white is 5.19 mm. Design elements consist mainly of broad bands near the rim, and running parallel to it, with other linear designs, triangles, and checks adjoining. Dots, which are common in the Great Salt Lake area, are lacking here.

Shoshone ware. It is often difficult to differentiate between Deep Creek Buff and Shoshone ware, because many features are shared. If all specimens were whole, the problem would be simplified, as the forms of each type are fairly well known, but temper, surface treatment, color, thickness, and other characteristics tend to be so similar that they have little value as diagnostic criteria. However, a few specimens with thickened rims and others with incised body designs show that the Shoshone occupied camp sites on the Fifteen-Mile. Points of Shoshonean type found on the same sites substantiate this belief.

A large quantity of Shoshone ware was collected on a ridge just west of Spring Creek, where the stream emerges from the Spring Creek Mountains. None of these are decorated with fugitive red, but a few have simple incised body decorations. Incised rim designs, which are very common in Promontory wares farther north and east, are lacking, but the two types are alike in the possession of thickened rims—a trait not common in Pueblo pottery. In form, they apparently are globular ollas with rounded bottoms; flat-bottomed wares have not yet been identified in this region. The finding of side-notched arrow points and the scarcity of Pueblo tanged points confirms the suspicion that this is almost exclusively a Shoshone site. Another Shoshone site is located in a low pass leading through the mountains at the north end of Deep Creek Valley, on the banks of the Deep Creek proper. Shoshone ware and Shoshone points were also collected here.[9]

Although Great Salt Lake pottery types are found in quantity at Deep Creek, the Sevier types are most common and abundant. Deep Creek, then, must have been a borderline region where traits from both these Pueblo areas overlapped, with influences from the Sevier area predominating. Pottery types also indicate that the Pueblo culture was supplanted by Shoshoneans without an intervening Promontory Culture stage. This is rather surprizing, as Promontory artifacts have been found in abundance at Wendover, Utah, seventy miles north. There are no major geographical barriers which would have impeded the trek of Promontorians southward. Could that barrier have been human—that is, Shoshonean?

[9] Dibble, 1940. The site described in the present paper has so far been unreported, but it is located about one-half mile north of U-157 and U-158, described in Dibble's paper.

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Dallas, Texas
January, 1946

DISTRIBUTION AND BIBLIOGRAPHY OF THE PETROGLYPHS OF THE UNITED STATES

ROBERT M. TATUM

PROBABLY the study of petroglyphs and pictographs has been the most neglected field of archaeology. This disregard has prevailed despite the fact that both types of drawings exist in almost every state. Few attempts have been made to study the relations between different sites or between petroglyphs and other remains. Petroglyphs are regarded with little concern because little is known about them and detailed descriptions will not help to solve the problems confronting the investigator.

This apathy is due to several factors and probably not to laxness on the part of archaeologists in general. First, the nature of petroglyphs has made their collection difficult if not impossible. The field worker in earlier days, confronted with the alternatives of devoting his time to the collection of artifacts and noting more important features or spending long hours copying petroglyphs, properly chose the former. Secondly, the number of petroglyph sites in the eastern United States was limited so that, as work progressed westward, their importance was minimized by investigators. Finally, when an interest in petroglyphs did manifest itself, attempts were made to read a meaning into each design. Such attempts failed because of the fact that petroglyphs do not represent a written language, or anything like it. The hundreds of books written about Dighton Rock in Massachusetts are indicative of early interest. In the course of studying the subject, the author has found persons who still believe the "pictures" hold the key to a lost language and who refuse to describe sites because they hope to be the first to decipher the language.

Today the science of archaeology and the examination of the remains left in North America have progressed to such a degree that a complete study of petroglyphs is advisable. Despite all the field work done in some regions, many problems of relationship with other areas still remain unsolved. Many authors have expressed the belief that if more were known about the drawings they might perhaps find the solution to the problems. If this is true, then a complete study of the subject is necessary. If it is not true, then that fact should also be known and made public so that future workers will not resort to vague statements about possible relations with other sites.

The problem with which the study of petroglyphs is concerned is then a double one. First, the relationship between petroglyphs in different areas must be determined. Second, and more difficult, the relationship of petroglyphs to other cultural remains must be found. Comparison of designs of petroglyphs and ceramic designs, etc., will accomplish the second.

The first monumental attempt to study petroglyphs was made by Garrick Mallery. He published two works on the subject and presented a mass of material on designs as related to work in bone pottery, and small objects. He included descriptions of seventy-seven sites where petroglyphs may be found. This work has formed the basis for all later investigations.

It was the work of Julian H. Steward which created the first interest in the study of the distribution of petroglyph sites. His study of sites in California and neighboring states formed the basis for later works. Working in a state where many such sites are found, Steward identified forty-four elements of design, certain of which he found to have continuous distribution. Steward's brief study of California disclosed more than two hundred sites, or twice as many as Mallery had noted for the whole nation.

Later, in Oregon, L. S. Cressman issued a similar report, using the same method and locating sixty sites in one state alone. His report showed the relationship of sites in California to those in Oregon. In Texas, A. T. Jackson reported some 195 sites in 1938 and again the study of distribution yielded results. Previous reports on petroglyphs in Colorado by Renaud listed the sites without attempting any study of the distribution of sites or designs.

W. H. Over has prepared a report on the sites in South Dakota.

More recently, reports have been in preparation on petroglyphs and pictographs in Washington, Iowa, and Utah. Unfortunately, the other states still remained unexamined. Although several persons in the country have collected material on the subject for a number of years, nothing has been published. This condition existed when the author began his study of the subject some years ago.

The study of petroglyphs is a difficult one

and must be approached in an impartial manner. There are, first, the problems of reproducing the designs found at the sites. Before the time of photography, sketches or plaster casts were made. Today, photographs are being used more and more commonly. In order to note design elements clearly, line drawings are usually made from the photographs. Some archaeologists have maintained that the size of the drawing was of great importance, but it seems that the nature of the rock rather than local custom determines the extent of the artist's work.

The treatment by Steward has shown how the problem can best be approached. A study of the problem should include a description of the site and its location. The designs should be reproduced by line drawings or by photography. Any patination, as well as style of manufacture —including color in the case of pictographs— should be noted. The worker should then attempt, with complete impartiality, to note the typical design elements, in the cases where this is possible, and then record their distribution on a map of the region. Hence, the only element of error is that connected with placing typical designs, and that should be small. When known sites are located, it is often possible to predict where other sites should exist so that a search may be made for them. The next step is to study drawings and designs on other artifacts and obtain relations between the two. This has yet to be done on a large scale in any region.

The examination of a small region is a simple matter. Persons who know of sites can be found and each site can be visited. The examination of the whole United States presents a much greater problem. The sites cannot all be visited, and only by means of thousands of letters can contact be made with all who know of sites. Furthermore, in many regions the older sites no longer exist. These reasons have no doubt prevented a previous study of the country as a whole. It was the author's opinion that study of the subject had advanced far enough to make it possible to begin such a study and complete it without too great an effort.

It was soon discovered that even the largest museums had no records concerning certain states, while individuals did possess this information. Thus a plan to get in touch with all state universities, large museums, state archaeologists, and individuals belonging to archaeological organizations was formulated. In addition, inquiries were made of forest rangers, state police, chambers of commerce, and county agents. Despite this, there are several states

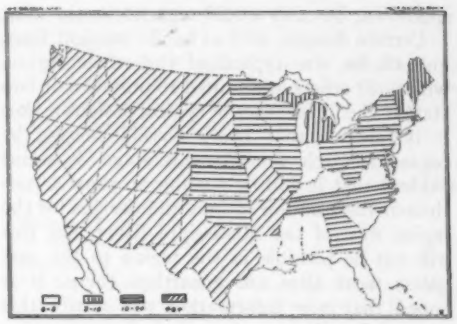

FIG. 47.—Distribution of petroglyph sites in the United States.

and locations where no information can be found. It is hoped that the readers of this preliminary report will be able to furnish aid and information which will be included in the final report on the subject. To date, thirty states have been visited, and in every case the fullest cooperation has been received from residents. The aid of those who made special trips to sites to copy designs is greatly appreciated.

Information received shows that in certain states the job to be done is much greater than was realized. In others, the lack of sites indicates no further work need be done.

The complete treatment of the problem will total several hundred pages at the least and is beyond the scope of this article. Therefore, this discussion will present a general view of the distribution of sites in the United States without regard to design elements. It is hoped that new sites in those regions where little is known will be called to the attention of the author.

As will be noted in Figure 47, there are, in the United States, three regions where no petroglyphs have been reported. Examination of these regions shows that rock exposures on which petroglyphs may be pecked or incised or on which pictographs may be painted are lacking. In general, the regions with the greatest number of rock exposures have the greatest number of petroglyphs. The trait of "picture writing" is then a common one and is not confined to any one culture or tribe. The scarcity of sites in the east is no doubt due to the lack of suitable terrain, as we find numerous drawings on bone and other articles.

Although pictograph sites are not noted on the map, they are present in regions where petroglyphs are numerous. Whether they represent a higher stage of development is still

unknown, but this would seem to be the case.

Certain designs, such as hands, straight lines, and circles, are typical of the whole region, while still others are limited to only one or two states. The importance of typical designs makes it imperative that every possible design be copied at each site. At this stage, it seems evident that it will be possible to show a continuous distribution of sites and designs for the region west of the Mississippi River, but this will not be possible in the region to the east unless more sites are unearthed there. It is hoped that new information will clarify this eastern situation.

Following will be found a list of states with information concerning the petroglyphs to be found in each. In most cases the number of sites indicated is approximate. The location given is that of the majority of sites. Also included is a notation as to whether the location of the sites, as well as the distribution of design elements, appears to be continuous with those elsewhere. The names of those archaeologists who have published upon sites in the state are listed; their articles may be found in the bibliography at the end of this article. In each case the author has noted the extent of work done in an area and has tried to decide if more sites should exist in the state. In the cases of Oregon and other states where complete surveys have been made the need for more information does not exist. In others, where little investigation has been done and adjoining states are rich in sites, it seems probable that additional sites may be expected and it is hoped that residents of such areas will give what assistance they can.

State	Number of Sites	Location	Continuous	Complete	Authorities
Alabama	none			yes	
Arizona	500	scattered	yes	no	Mallery Steward Colton
Arkansas	50	northern	yes	no	McAdams
California	130	central borders	yes	yes	Steward Mallery
Connecticut	none			yes	
Colorado	100	scattered	yes	yes	Renaud Tatum
Delaware	none			yes	
Florida	none			yes	
Georgia	30	northern	yes	no	Mallery
Idaho	70	scattered	yes	no	Mallery Erwin
Illinois	30	scattered	yes	no	Mallery Merwin McAdams
Indiana	none			yes	
Iowa	30	northern	yes	no	Starr Winchell
Kansas	20	northern	yes	no	Mallery Wedel
Kentucky	3	scattered	no	yes	Mallery Webb
Louisiana	none			yes	
Maine	3	northern	yes	no	Mallery Willoughby
Maryland	5	northern	yes	no	Mallery Marye
Massachusetts	20		no	no	Mallery Delabarre
Michigan	2	northern	no	no	Hinsdale Greenman
Minnesota	20		yes	yes	Winchell Mallery Harvey
Mississippi	none			yes	
Missouri	50	eastern, southern	yes	yes	Eichenberger Diesing
Montana	40	scattered	no	no	Turney-High
Nebraska	30	southern	yes	no	Mallery
Nevada	100+	scattered	yes	no	Mallery Steward
New Hampshire	none			no	
New Jersey	0		no	yes	Cross
New Mexico	100+	scattered	yes	no	Mallery Steward Renaud Jackson
New York	20				Cadzow Parker Mallery
North Carolina	10	western	yes	no	Mallery
North Dakota	40	northern	yes	yes	Will
Ohio	20	scattered	yes	no	Mallery Altick Banks Whittlesey Fowke Ward Hampton Davis
Oklahoma	30+	scattered	yes	no	Renaud
Oregon	60	scattered	yes	yes	Mallery Cressman
Pennsylvania	35	scattered	yes	no	Mallery Cadzow
Rhode Island	10		yes	no	Delabarre
South Carolina	none			no	
South Dakota	40	scattered	yes	yes	Mallery Over
Tennessee	30	scattered	yes	no	Mallery
Texas	200	western	yes	yes	Mallery Jackson
Utah	100+	scattered	yes	no	Mallery Steward Kelly
Vermont	3	southern	yes	yes	Jacobs
Virginia	1	scattered	yes	no	Mallery
Washington	100+		yes	no	Mallery Hutcheson Cain
West Virginia	30	scattered	yes	no	Mallery
Wisconsin	20	scattered	yes	no	Mallery Brown McKern
Wyoming	50+	southern	yes	no	Mallery Renaud Steward Knight

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U. S. Naval Academy
Annapolis, Maryland
December, 1945

FACTS AND COMMENTS

HOPEWELL-COPENA SITES NEAR NASHVILLE

A. J. Waring, Jr. has reported certain Hopewellian elements in northern Georgia.[1] His comments reminded me of a site, previously unreported, in the vicinity of Franklin, Tennessee.

I report from my field notes a site discovered two miles west of Franklin, atop Reid Hill, a knob 140 feet high: "Built on the flat top of the hill, the conical mound measures 18 feet high by 80 feet in diameter. The mound is built of stones and earth. (These stones are large and numerous. It is essentially a stone mound.) A deep trench had been cut into the east side of the mound but no sherds, flint, or other material were visible." Its situation, on a high hill in the flat Harpeth Valley, is similar to that of the many stone mounds reported from Georgia. No central depression was observed, but it may have been destroyed by the trench. I was unable to learn who dug into the mound so do not know whether artifacts were recovered.

FIG. 48.—Folsom points from collections of William Polk, Franklin, Tennessee.

A second important site, mentioned by Myer, lies one mile west of the Reid Hill site. My notes read: "On Boyd's Mill Road on the terrace along the south bank of the Harpeth River are two conical or domed mounds. These are 9 feet high, 50–60 feet in diameter. There is a mound on each of two parallel low ridges which run north and south (perpendicular to the river). Both are now protected by tree growth but have been pitted in the past. No pottery could be found but there were large quantities of flint scrap and broken projectile points in the fields around the mounds."

In a summary of the Natchez Trace Parkway Survey,[2] I made no mention of the Copena-like site just described, nor was the unusual large stone mound on the high knob cited in the references to the Nashville area. I did, however, point out that there are in the Harpeth Valley both Archaic and Middle Mississippi sites. In an attempt at brevity I fell into the same rut as have others who have worked in the vicinity of Nashville in my emphasis of the Tennessee-Cumberland remains. The wealth of loot has led most investigators, except Myer, to ignore the less spectacular material which apparently exists in some quantity. It is my opinion that many of the sites where only flint debris occurs, found on almost every terrace along the Harpeth River, can be assigned to the Copena horizon; some of the flint sites will remain, as at present, in the Archaic bracket.

In connection with these probable Copena remains of the Harpeth Valley, I should like to call attention to one of the largest collections of Folsom points I have seen in the East. The collector, Mr. William Polk of Franklin, Tennessee, asserts that all of these points have been recovered from the surface within ten miles of Franklin, but he made no attempt to label the specimens or keep a record of the sites of origin. The points, as shown in Figure 48, fall into two groups. Four are slender and are characterized by constricted neck and fishtail base. Of this lot, one piece is fluted from base to tip. The other three specimens are fluted for more than three-quarters of their length. The four points of the second group have shorter longitudinal flake scars but possess the shape and basal form characteristic of the western Folsom.

Webb and DeJarnette include the Folsom point as a trait of the Copena focus in the Pickwick Basin.[3] By listing this trait as characteristic the authors indicate that they regard the Folsom points of the East to be much later than has previously been believed. In view of this implicit belief, the existence of the Polk collection in a region where heavy Copena occupation will eventually be demonstrated is important. I hope some student, taking Webb and DeJarnette's hint, will analyze the distribution of eastern Folsom finds as these are related to the occurrence of Copena-Adena sites for more evidence concerning the antiquity of the eastern Folsom.

JESSE D. JENNINGS
National Park Service
Tupelo, Mississippi
May, 1946

THE LEAKE MOUNDS, BARTOW COUNTY, GEORGIA

The Leake mounds are located 1½ miles west of Cartersville, Georgia, on the north side of the Dallas-Rockmart road. They lie a short distance back from the left bank of the Etowah River but are still in the river bottom. They were briefly mentioned by Moorehead in *Etowah Papers*, but he did not discuss the type of material there. The group consists of three mounds, of which one was flat-topped and the others domed, at least in recent years. The mounds lie directly across the Etowah River from Ladd's Mountain, where Waring recently reported the destruction of a tomb of Hopewellian type. In 1940 the Leake mounds were also sold to road builders and the greater part of them now forms the fill for the new bridge at that point. Pat Wofford, Jr., of Atco, Georgia, observed the destruction of the mounds and salvaged as much material as possible. The other authors are indebted to him for calling to their attention the significance of the remains.

The authors visited the site and found that the basal parts of the largest, and only flat-topped, mound still re-

[1] AMERICAN ANTIQUITY, October, 1945, pp. 119–120.
[2] AMERICAN ANTIQUITY, April, 1944.
[3] Bureau of American Ethnology, Bulletin 129.

main. It has been cut down to the level of the surrounding knoll, but a very dark humus deposit was still visible. This black humus was at least a foot thick along the ditch of the the Dallas-Rockmart road. Overlying it were the remains of a mottled brown element that may represent mound fill. No evidence of one mound could be found, but two small scraps of the sides of the third mound are still present. From the present state of the site it appears that the submound material, as well as the general village remains, are still largely present.

The pottery from the site shows a number of types, among which the most abundant was a complicated stamped ware. Curvilinear designs like Lamar Complicated Stamped were present, as were the diamond-shaped stamped elements so common at the Etowah mounds. All or most of these sherds were sand-tempered. Other types present in small amounts were Checked Stamped and Simple Stamped. Apparently these last two types represent an occupation of the site by an earlier group, previous to the Etowah-Lamar period.

The artifacts recovered during the destruction of the mounds were of an older type than any found at the nearby Etowah mounds and have not yet been reported from other sites in the area. Most striking was the presence of numerous plummets. All are made of a grainy magnetite and are of considerable weight. The grooves are narrow, triangular cuts that completely encircle the plummets. A pipe which was recovered in fragments has been restored by Mr. Wofford; it is eight inches long and is made of a yellow and white banded slate. One copper disk and two short tubular green slate beads were found. A copper bead was found, but it is too small to permit description of technique of manufacture; it appears to be a drilled nugget, although this appearance may be the result of corrosion. There was also a flat piece of graphite with a shallow pit scored in each face. All the objects may have accompanied burials, though the grading operations made accurate observations impossible.

Since the bases of the mounds undoubtedly remain at the Leake village site, perhaps some further information or material may be recovered.

These artifacts do not belong to the late Middle Mississippi complex described by Moorehead for the Etowah mounds but do resemble the Adena-like remains from farther north. Taken with the burial of Hopewellian type described by Waring from nearby Ladd's Mountain, they indicate an early occupation of the Etowah River valley. This occupation apparently has certain artifactual relationships with the Adena-Hopewell complexes. The Copena complex described by Webb for the Tennessee River seems to be a close relative culturally and spatially. The exact position of the remains of early type from the Leake mounds is not clear at present. However, a recent survey by the authors, in the area to be flooded by the proposed Allatoona Dam, upstream from Cartersville, indicates the presence of small village sites characterized by the early types of stamped pottery (Simple Stamped and Checked Stamped).

This assemblage of artifacts has not been found in central Georgia or coastal Georgia, where recent work has fairly well outlined the cultural sequences. But it is possible to estimate the relative position of the minority pottery types from the Leake mounds. Checked Stamped and Simple Stamped types are found associated with the Deptford period on the Georgia coast and with Swift Creek in central Georgia. Both of these complexes follow the fiber-tempered levels and precede the Lamar and Macon Plateau levels, which form the base of the Middle Mississippi series in Georgia. On the basis, then, of the fact that the minority pottery types are earlier than Mississippi in central and coastal Georgia we may conclude that they are also early in north Georgia. Whether or not they are to be associated with the artifacts cannot be determined, but it is a possibility.

CHARLES H. FAIRBANKS
ARTHUR R. KELLY
GORDON R. WILLEY
PAT WOFFORD, JR.

THE IDENTITY OF THE ITZAS

In a review of a recent book by the writer, *The Origins and History of the Mayas, Part I, Introductory Investigations*, Los Angeles, 1945, Mr. J. Eric S. Thompson, of Carnegie Institution, levels criticism against what he considers its main thesis, the identification of the Itzas with the rulers of the Maya "Old Empire."[1] Although the full development of this thesis is planned for publication in Parts II and III of his work, the writer desires the privilege of making a brief answer to this criticism in the present journal.

In the first place, this Old Empire Maya identification of the Itzas is not a new theory, as acknowledged by Mr. Thompson himself. Nor is the writer alone in holding it at the present time. The opposing view, advocated by Thompson and some others, that the Itzas were not the descendants of the Old Empire rulers but the people who introduced the late central Mexican culture at Chichen Itza, has not been conclusively established in its place.[2]

The first specific charge brought by Thompson against the writer's brief presentation of the evidence for this Old Empire identification is that he, the writer, credits the Book of Chilam Balam of Chumayel with the statement that the Itzas were the builders of the "mounds" or temple pyramids of Yucatan during seventy-five katuns or twenty-year periods before their abandonment of Chichen Itza (hence including the Old Empire), whereas (quoting Thompson) "the source merely states that the 'great men' built the mounds, making no mention of Itza or of Chichen Itza." In answer to this, the writer admits that the Itza or Itzas are not referred to in this statement by name but

[1] AMERICAN ANTIQUITY, Vol. 11, No. 3, January, 1946.

[2] It may be noted that Thompson's whole scheme of reconstruction of pre-Conquest Yucatan history, including his theory of identification of the Itzas with the "Mexican" conquerors of Chichen Itza (see his "A Survey of the Northern Maya Area," in AMERICAN ANTIQUITY, Vol. 11, No. 1 (July 1945), pp. 3–4, 12–18), requires the assumption that the record of the katun chronicles has been considerably garbled by the post-Conquest Maya compilers (as indirectly acknowledged by him in his review). Before attributing such extensive ignorance of their own history to these native Maya historians, we should be certain that their record as it actually stands is definitely contradicted by the archaeological evidence. This contradiction has not yet been demonstrated.

must point out also that Thompson apparently neglected to read the footnotes to the writer's quotation of the statement, which give the basis for his view that it refers to the Itzas. The statement reads, in the language of the Maya compiler of the Chumayel book, as translated by Roys:[3]

> The history which I have written of how the mounds came to be constructed by the heretics. During three score and fifteen katuns they were constructed. The great men made them. . . . On this day I have written how the great mounds came to be built by the lineages, and all the things which the rulers did. . . . Fifteen four-hundreds were the scores of their mounds, and fifty ⟨more made⟩ the total count of the mounds they constructed all over the land. From the sea to the base of the land they created names for them as well as for the wells. . . .

Now the appellation "heretics" given in this passage to the "great men," "lineages," or "rulers" who built the mounds from the earliest times was—as indicated in one of the writer's footnotes—a term applied especially to the idolatrous Itzas of late Chichen Itza times.[4] Moreover, the Itzas are distinguished elsewhere in the Chumayel book itself as "the great Itzas,"[5] and "the lords,"[6] and in the Chronicle of Mani as the "holy men,"[7] which connects them with the building of the temple pyramids. Finally, in the quoted passage itself the "great men" or "rulers" who built the mounds are also stated to be the people who named the wells of the land. In another part of the Chumayel we are clearly informed that it was the Itzas who "named the wells."[8] This, therefore, justifies us in concluding that, at least according to the Maya compiler of the Book of Chilam Balam of Chumayel, the builders of the mounds from the earliest times were the Itzas.[9]

Mr. Thompson next takes issue with—in his words—the writer's "argument that the persons depicted on Itza sculptures of the Mexican period at Chichen Itza are of the same physical type as those on stelae of the central area." This is a misrepresentation of the writer's position. What the latter claims is merely that persons of Old Empire Maya type are depicted at Mexican Chichen Itza, not that all or even most of those shown are of this type. In fact, his thesis that the Itzas of Chichen Itza in the Mexican Period were descendants of the Old Empire rulers *requires that only a few of the representations there of that period show the Old Empire type*, for the reason that the rulers of that time were "Mexicans" and not the Itzas, who were the subject people (as shown further in the following), and that therefore most of the sculptures were the work of, or were executed under the direction of, the "Mexican" rulers and are not "Itza sculptures," and consequently do not represent Itzas but the "Mexican" rulers! Most of the sculptures show persons with straight or slightly aquiline noses, firm mouths, and jutting chins, which, with their non-Maya "Mexican" accoutrements, identify them with the "Mexican" rulers. A few, however, clearly depict the typical Maya profile of the Old Empire rulers.[10] This, therefore, validates the writer's citation of the evidence of physical type in support of his Old Empire Maya identification of the Itzas.

Finally, in a third attempt to refute the writer's thesis, Thompson asks why the Itzas "abandoned glyphic writing and introduced new architecture and a new religion" at Chichen Itza of the Mexican Period in their conquest of that city, if they were descendants of the Maya Old Empire rulers, and why the Chilam Balam writers term them "lewd, sinful, avaricious, idolatrous foreigners" when "nothing could be more prim than the art of the Initial Series period." The answer is self-evident, in view of the foregoing. If the Itzas *were* the descendants of the Old Empire rulers, they did not conquer Chichen Itza and did not establish there a new architecture and religion. On the contrary, they must then have been *the people of Chichen Itza who were conquered*, i.e., descendants of its original Maya founders of the late Old Empire or Transitional Period (as indicated in the foregoing, and also in the sources[11]), a group of whom were still living there when it was conquered, after a brief period of temporary abandonment.[12] As likewise indicated, the conquerors were "Mexicaps," also called "foreigners" and identified with a certain Nacxit Xuchit or "Quetzalcoatl" (or "Kukulcan") and his companions.[13] From these foreign "Mexican" conquerors,

[3] Ralph L. Roys, ed. and tr., *The Book of Chilam Balam of Chumayel*, Washington, 1933, pp. 79–90.

[4] *Ibid.*, p. 115; see also Roys, *loc. cit.* footnote 4.

[5] *Ibid.*, p. 82.

[6] *Ibid.*, p. 140.

[7] Chronicle of Mani, Brinton, 1882, and Martínez Hernández, 1927, eds., Sec. 5 (referring to a time before they became the idolatrous "heretics" of late Chichen Itza).

[8] Roys, *op. cit.*, pp. 70–72.

[9] Since it is indicated in closely following passages of the Book of Chilam Balam of Chumayel (*ibid.*, pp. 81–83) that the end of the Itzas as a nation was held to be at their final abandonment of Chichen Itza, dated therein fifteen katuns before A.D. 1541, or A.D. 1246, we may consider this event as also that in mind here as terminating their pyramid-building activity, consequently dating the beginning of their construction of the mounds three score (i.e., three baktuns) and fifteen katuns before A.D. 1246, or *ca.* 233 B.C. (!).

[10] See, e.g., Earl H. Morris, Jean Charlot, and Ann Axtell Morris, *The Temple of the Warriors at Chichen Itzá, Yucatan*, Washington, 1931, Vol. 1, Fig. 248, *c*, *d*; Vol. 2, Pls. 44, *N*; 49, *N*; 50, *W*; 90, *S*; 98, *E*; 119, *W*; 157, *b*, *d*; 166, *lower center*.

[11] For probable source references to this settlement of the Itzas in the pre-Mexican Period at Chichen Itza, see Chronicle of Mani, *loc. cit.*; Roys, *op. cit.*, pp. 70–72 (an early migration of the Itzas from the east coast of Yucatan ("naming the wells" *en route* [see above]) to Cetelac (Yaxuna?) and apparently the nearby site of Chichen Itza (p. 74), perhaps to be identified with the *Cenial* or "Little Descent" and not to be confused with the invasion of the "Mexican" conquerors from the west.

[12] See, e.g., Chronicle of Mani, *eds. cit.*, Sec. 6 *et seq.*, in conjunction with the references of the preceding note (apparently a *return* of Itzas to Chichen Itza). This account, however, disagrees with the Chumayel passage cited and other references in assigning to the temporary abandonment a comparatively long period of some thirteen katuns. As the latter, however, is an arbitrary calendrical period, it is probable that the chronicle is in error on this point. The opposing references restrict this temporary abandonment to probably less than a century, which synchronizes the indicated first or pre-Mexican Period settlement of the Itzas at Chichen with the period of the early pure Maya architecture at that site.

[13] Perhaps with some Itzas picked up by them on their route of invasion, as also indicated in the sources. The invasion of these "Mexicans" or "foreigners" and their conquest and political organization of the land and rule at Chichen Itza, *after* the late Old Empire or Transitional Period establishment of the Itzas at Cetelac and Chichen Itza (see footnote 11), is apparently recorded in the Chumayel passage beginning with "Zubinche, Kaua . . ." on page 72, preceding the Hunac Ceel episode narrated on page 75.

as well as two later groups of "foreigners,"[14] they acquired the sinful habits and idolatry ascribed to them by the post-Conquest Maya writers. In fact, the Chumayel book, referring to an early period in their history, explicitly states:[15]

> Then they [i.e., "the great Itzas," as identified on the preceding page] adhered to ⟨the dictates of⟩ their reason. There was no sin; in the holy faith their lives ⟨were passed⟩.[16] The foreigners made it otherwise when they arrived here. They brought shameful things when they came. They [i.e. "the great Itzas"] lost their innocence in . . . the carnal sin of Nacxit Xuchit, in the carnal sin of his companions. No lucky days were then displayed to us.[17] . . . There was no great teacher, no great speaker, no supreme priest, when the change of rulers occurred at their [i.e. the foreigners'] arrival . . . .[18]

The almost complete absence of Maya inscriptions, and the occurrence, instead, of Mexican-style name glyphs, architecture, and religion, is attributable of course to the fact that these foreign "Mexican" conquerors, not the Itzas, were now the dominant group in control of such cultural activities.[19]

In view of these explanations, Thompson's "Mexican" identification of the Itzas and the categorical statement in his review that they "certainly did not belong culturally or physically to the group which dominated the central area" can not be considered final. In fact, they tend to establish just the opposite, i.e., that the Itzas actually were the descendants of the Old Empire rulers.

It may be noted, by way of postscript, that this confusion of the Itzas, or conquered Maya people of Chichen Itza, with the "Mexican" conquerors seems to have arisen largely from the ambiguous use of the term "foreigners" in the Book of Chilam Balam of Chumayel. This appellation was at first interpreted by the writer in his work as referring to the Itzas, but further study appears to indicate that in the present connection it belongs more especially to the "Mexican" conquerors. The Itzas were foreigners only in a more ancient sense, as the "hosts of Itza" or "elder brothers" who arrived among the "younger brothers native to the land" in early times.[20] This is the case at least in the passage quoted above, and therefore also probably in related passages, which may consequently be read as follows:

> Page 84 (*continuing the above quotation*): . . . Lewd were the priests [i.e., Nacxit Xuchit or Quetzalcoatl and his companions, and the Itza priests who came with them (see above, footnote 13) or adopted their sins on their arrival], when they came to be established here. Furthermore they left their descendants there at Tancah [Mayapan]. These then [i.e., "the great Itzas"] received the misfortunes, after the affliction of these foreigners. These, they say [i.e., these who "received the misfortunes"], were the Itzas. Three times it was, they say, that the foreigners arrived.[21] It was because of this that we were relieved from paying tribute at the age of sixty, because of the affliction by these men, the Itzas [i.e., the sinful Itza priests established by or under the foreigners at Chichen Itza, and later at Mayapan] . . . . However there is at least an agreement so that there may be peace between us [i.e., the Itza people, see above, footnote 17] and the foreigners . . . .
>
> Pages 168–169 (*prophecy of Chilam Balam referring apparently to the introduction of Christianity*): . . . Our Lord comes, Itzas . . . . Our elder brother[s] come, ⟨oh⟩ men of Tantun . . . . You shall worship today his sign on high . . . . But [you who are] those to whom the word is brought, lord, thrice weighed down is your strength, the younger brothers native to the land [i.e., the Itzas, as well as other inhabitants of Yucatan at the coming of the Spaniards, now the "younger brothers native to the land" in relation to the foreign Spaniards or "elder brothers," in contrast with the Itzas' own earlier position as the "elder brothers"] . . . . The principal ones who spread ⟨sin⟩ [were] Nacxit Xuchit in the carnal sin of his companions, [and] the two-day rulers . . . . Behold, when they come [i.e., the "elder brothers" or Spaniards], there is no truth in the words of the foreigners to the land [i.e., Nacxit Xuchit and his companions] . . . .[22]

The theory of identification of the Itzas with the foreign "Mexican" conquerors appears also to have been advanced on the basis of the chronicled origin of the Itzas in a region of *Tulapan*, *Zuiua*, and *Nonoual* to the west of Yucatan,[23] place names occurring also, though in somewhat different forms, in the historical and mythological literature of central Mexico. This does not, however, identify them with the "Mexicans," since there is considerable evidence that these names refer here to the western Maya country of western Campeche and Tabasco, and not to central Mexico, and also to an earlier period than the "Mexican" invasion, as will be shown in Part II of the writer's work.

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[14] *See* Roys, *op. cit.*, p. 84.

[15] *Ibid.*, pp. 83–84.

[16] Cf. the appellation of the early or pre-Mexican Period Itzas as the "holy men," in the Chronicle of Mani, previously cited.

[17] I.e., by the Itza priests to "us," the Itza people? The compiler of the Book of Chilam Balam of Chumayel identifies himself further on (*op. cit.*, p. 119) as a "Maya Itza."

[18] Cf. *ibid.*, p. 169; also Antonio Chi, in his 1579–1581 account, reconstructed and translated by the writer in his book, p. 95, Secs. 1–2, 4a–4c (4c: "It is said that the first settlers of Chichen Itza were not idolaters until Kukulcan, a Mexican captain, entered these parts, who taught [them] idolatry").

[19] By the end of the period, however, the Itzas appear to have regained the rulership (as indicated by the Maya title *Chac-xib Chac* of the city's ruler in the war with Hunac Ceel and his "Mexican" mercenaries of Mayapan, and also by the latest sculptures of the period, which depict more frequently the Old Empire Maya physical type), either by absorption of their first "Mexican" conquerors or by a political coup. This was too late, however, to restore the ancient culture, except in a decadent form.

[20] Book of Chilam Balam of Tiximin, cited by Roys, *op. cit.*, p. 169, footnote 1. The term is also applied of course to the Spaniards.

[21] I.e., evidently the party of Nacxit Xuchit or Quetzalcoatl and his companions, that of the "Mexican" mercenaries of Hunac Ceel, and that of the foreign mercenaries ⟨Ah Canul⟩ said by Landa to have been brought over by the last Cocom ruler of Mayapan; cf. p. 115 of the present source, where "the enemies" who introduced "heresy" among the Chichen Itzas are said to have brought force to bear on them and established their "religious festival" among them three times.

[22] I.e., the teachings of the Spaniards show the falsity of the "words" or sinful and idolatrous teachings first promulgated by Nacxit Xuchit and his companions, the particular "foreigners to the land" before the arrival of the foreign Spaniards.

[23] See pp. 64, footnote 38; 65, footnote 39; and 171–173 of the writer's work.

Finally, it may be added that Mr. Thompson also criticizes the writer's preliminary chronological reconstruction of Maya history presented in the reviewed work by pointing out that Beyer's "Type B" glyphs, which the writer assigns to the Mexican and Late periods, are found in inscriptions on the Monjas at Chichen Itza and on similar structures whose architecture dates them from the close of the Initial Series period (i.e., early Transitional, in the writer's terminology; see below), and also in the Dresden Codex, which the writer also dates from late Initial Series or early Transitional Period times. The writer's explanation of this is that the Type B glyphs in these building inscriptions date from the "Transitional" period in the stylistic history of the Maya hieroglyphic writing, when these forms began to appear, i.e., from the late pre-Mexican period in the architectural sequence. An alternative explanation is that these buildings not improbably continued in use by the Itzas, according to the above identification of the latter with the rulers and builders of the Maya Old Empire and Transitional Period, until the close of their occupation of Chichen Itza, or the end of the Mexican Period, though under the domination most of the time of the foreign "Mexican" conquerors; or the buildings were at least visited by them occasionally as important monuments left by their forbears of the Transitional Period. The occurrence of these Type B Maya glyphs on the Transitional-style buildings is therefore not surprising.[24] Similarly, we find Type B glyphs in the Dresden Codex because the latter, although probably dating *in its original* from the late Old Empire or Transitional Period—in view of its full Long Count dates—survives to us only in a Mexican- or Late-period copy when the Type B glyphs were in use.

Incidentally, the writer's "Transitional Period," criticized by Thompson as "nebulous" and showing a "faulty comprehension of subject matter," intentionally differs from the traditional restriction of this period to the time after the latest discovered Initial Series, in its downward extension to include the full phase of "Transitional-style" architecture, which appears to have largely preceded the latest Initial Series—as a provincial rather than temporal divergence from the Old Empire architecture—and also in its lateral extension to include the contemporary declining period of the Old Empire itself in the Peten and the late phase of the Tepeu pottery, i.e, from the apogee of the Old Empire at about 9.18.10.0.0. This concept of the Transitional Period, as the epoch of the Old Empire decline and full Transitional-style architecture, as well as of the brief post-Initial Series cessation of major building activity and invasion of the foreign "Mexicans," can hardly be termed "nebulous." It defines a clear-cut transitional period of Maya history, marking the concluding stage and disappearance of the typical Maya civilization before the rise of Mexican Chichen Itza.

M. WELLS JAKEMAN
Los Angeles, California

[24] This is supported by the fact, noted by Thompson (*op. cit.*, footnote 1, p. 9), that architectural elements and constructions of the Mexican Period are also found in these buildings.

BOOK REVIEWS

Archaeology of the Upper Rio Grande Basin in Southern Colorado and Northern New Mexico. E. B. RENAUD. (University of Denver, Department of Anthropology, Archaeological Series, Sixth Paper, 44 pp., Denver, 1946.)

This paper summarizes a survey of the upper valley of the Rio Grande in southern Colorado and north-central New Mexico during the summers of 1942, 1944, and 1945. It is one of a series of papers on surveys conducted by the University of Denver in Wyoming, Colorado, and northern New Mexico

The area encompassed by this report is, in part, peripheral to the sphere of the Pueblo peoples. The purpose of the survey was to establish the paths of intrusion of the Pueblo culture to the north. However, the survey uncovered a new "Upper Rio Grande Culture," characterized chiefly by a long, broad projectile point with a small oblique-angled shoulder, named the "Rio Grande point," and by percussion-shaped cores and flakes. At one site (C-932), two students found that evidence of Pueblo occupation lay superimposed upon the layer containing artifacts of the Rio Grande Culture.

This report redescribes many of the rock shelters, work shops, and open sites reported earlier by the University of Denver. Information regarding new sites is inserted in its proper position according to the route traveled. The report's importance lies in its designation of sites for future research. However, its scientific continuity is frequently interrupted by descriptions of the weather encountered or scenery observed while stopping for lunch, or by remarks on the scarcity of gasoline. In addition, some confusion may result from Dr. Renaud's rather loose use of the Old World term "Clactonian" in his descriptions of American stone artifacts.

Inclusion of a sketch map of the area toured would have been helpful. Sites are located as to township, range, and section, but, unless a particularly detailed map is in the hands of the reader, many sites will be difficult to locate merely from the text of the report.

The material from which the Rio Grande point and associated artifacts were made is referred to only as "black stone"[1] by Dr. Renaud. It is possible that this material is the "glassy andesite" previously reported from this area by Kirk Bryan and Arthur P. Butler.[2] The sparse bibliog-

[1] Page 34.

[2] K. Bryan, and Arthur P. Butler, Jr., "Artifacts Made of the Glassy Andesite of the San Antonio Mountains, Rio Arriba County, New

raphy includes only three references, all of which are attributed to Dr. Renaud himself. This might well have been enlarged to include this report and other publications on similar problems in the same area by Bryan[3] and by Adelaide K. and Ripley P. Bullen.[4]

HERBERT W. DICK
University of New Mexico

An Incised Maya Inscription in the Metropolitan Museum of Art, New York. HERMANN BEYER. (Middle American Research Records, Vol. 1, No. 7, 4 pp., 6 figs. Middle American Research Institute, The Tulane University of Louisiana, New Orleans, 1945.)

The Maya Hieroglyph Chicchan Derivative. HERMANN BEYER. (Same series, Vol. 1, No. 8, 2 pp., 8 figs., 1945.)

These two short papers appear pursuant to an announced policy of posthumous publication of manuscripts left by Hermann Beyer, the outstanding Maya scholar and epigrapher. Number 7 undertakes to place two Calendar Round dates in the Maya Long Count. It also speculates on the provenience of the piece on which they are recorded, the reasoning being based on the supposed use of one large and two small dots in writing the day-sign *Ix*, twice on the object and once on Lintel 3 at Piedras Negras. Number 8 corrects a published drawing and opinion of S. G. Morley, using Morley's photograph of the glyph concerned, also at Piedras Negras.

The criticism of Morley's drawing appears to be justified. The other paper shows that Beyer's own drawings may on occasion mislead. The *Ix* glyph on Lintel 3 is evidently the ninth in the row of incised glyphs at the bottom of the stone. Beyer notes that when he made his drawing he "was sure that the lower dot was considerably larger than the upper two. In photographs, however, the difference does not appear so great." Checking the original stone, which happens to be available in the University of Pennsylvania Museum, I am convinced that the lower dot is perhaps a shade smaller than the other two; it certainly is no larger. The argument as to possible provenience of the jadeite piece breaks down, I think, because it is based on a faulty drawing. A lesson can be drawn from these two papers—satisfactory photographs should take precedence over drawings. In ninety-nine cases out of a hundred drawings of these two great Maya epigraphers may be correct to the last detail, but the case with which one is concerned at any time may be the hundredth one.

LINTON SATTERTHWAITE
University of Pennsylvania Museum

Cultura Salinar: Síntesis Monografica. RAFAEL LARCO HOYLE. (Chiclín, Trujillo, Pp. 1–20, 49 figs. 1944.)

This newly determined culture of the North Coast of Peru had been suspected for some years, on the basis of purchased vessels, but was first discovered in the ground by the author in February, 1941, and is briefly mentioned in the colophon of his *Los Cupisniques*, published later in the same year. Since then Larco has opened 228 tombs belonging to this culture, mostly on the edge of Chicama Valley, with some in Viru that are "Cupisnicoide," i.e., North Coast Chavinoid or transitional thereto. There is tomb superposition: Salinar above Cupisnique and Mochica (Early Chimu) above (or into) Salinar; this is the sequence that would be inferable on stylistic grounds. Salinar is just too distinctive to be reckoned as Proto-Mochica. But it is precisely the sort of culture from which Mochica could have grown by selective differentiation and specialization of skills.

The present little monograph is a summary of what is so far known on the culture. The text is accompanied by good-sized figures of twenty-five pots, group pictures of some fifty others, illustrations of ten tombs, several bone objects, gold, and cloth fragments.

The pottery is figure-modeled; stirrup-mouth, figure-bridge-and-spout, and bottle with handled spout are the most characteristic forms. The ware is unslipped reddish, sometimes painted with white or white and red. The modeling attempts much the same range of subjects as Mochica—including erotic scenes—but the execution is much cruder. Now and then there is surface decoration with creased pellets in dot appliqué.

The culture had a little sheet gold—pendants, nose rings, etc.—which are said to show not only hammering but soldering. One green-patinated fragment suggests copper-gold alloy. Cloth fragments have close warps and are of the nature of lawn, although whether they are cotton or wool is undetermined (the test of a bead produced by flame appears not to have been applied). There may well have been wool, since bone tools are from llamas. Bone spatulae are incised with designs suggesting rectilinear modification of Cupisnique incisings, with loss of meaning. Modeled figures show that caps were worn but suggest little or no body clothing. Tombs are oval pits covered with slabs; bodies are extended, usually laid on the right side (98 per cent), sometimes with a bit of gold in the mouth.

This is a most compact and useful outline of a culture whose very existence was not suspected ten years ago but which already seems to have attained a secure place in the scheme of Peruvian development. It is much to be hoped that the author will present his data on it with the same fullness as in his fundamental monographs on Cupisnique and Mochica.

A. L. KROEBER
University of California

Mexico," *University of New Mexico Bulletin*, Anthropological Series, Vol. 3, No. 4, 1940, pp. 27–31.

[3] Kirk Bryan, "Stone Cultures near Cerro Pedernal and Their Geological Antiquity," *Texas Archaeological and Paleontological Society Bulletin*, Vol. 11, 1939, pp. 9–46.

[4] Adelaide K. and Ripley P. Bullen, "A Pueblo Cave Site at Tres Piedras, New Mexico," AMERICAN ANTIQUITY, Vol. 8, No. 1, 1942, pp. 57–64.

NOTES AND NEWS

THE VIKING FUND MEDAL AND THE VIKING FUND PRIZE

The Board of Directors of the Viking Fund has voted to make available for the year 1947, and it is hoped annually thereafter, three gold medals together with three prizes of $1000 each to such scholars who have made the most significant contributions in the three basic divisions of anthropology, namely: Archaeology, Cultural Anthropology, and Physical Anthropology. These awards, to be known as the Viking Fund Medal and the Viking Fund Prize, are to be made by the representative anthropological associations, upon the advice of committees appointed by themselves, and will not be subject in any way to control or restrictions by the Fund. It is understood that no award will be made if, in the opinion of the associations, no contribution worthy of the award has been made in a given field during the course of the year. As the intention of the Board is to make the conditions of these awards as liberal as possible, it is their hope that the significance of a contribution will be evaluated either in terms of the results achieved through research, experiment, and discovery; or in terms of published literary, historical, and creative achievement. A recommendation for the Viking Fund Medal and Prize should be made by President of each of the representative associations to the Director of Research of the Fund before December 31, 1946.

In connection with this announcement, persons having suggestions to make are invited to send them to the President, for consideration by the Committee on the Viking Fund Prize and the Viking Fund Medal.

THE CHICLÍN CONFERENCE FOR PERUVIAN ARCHAEOLOGY, 1946

A conference on Peruvian archaeology was held at the Museo Rafael Larco Herrera, Hacienda Chiclín, on August 7–8, 1946 for the purposes of discussing and reviewing recent archaeological progress in Peru and for the promotion of greater intellectual interchange and cooperation between the Peruvian and North American students of Peru's prehistory. This meeting, coming toward the close of the Institute of Andean Research field program in the Virú Valley, marked the high point of the friendly cooperation and mutual discussions that had been shared by the Institute's Virú Valley group and the members of the Chiclín Museum since the initiation of the Virú program in April of 1946. The conference was planned and held under the joint auspices of the Museo Rafael Larco Herrera and the Virú Valley Committee of the Institute of Andean Research. Sr. Rafael Larco Hoyle, Director of the Museum, willingly placed the facilities of his establishment at the disposal of the conference group and was a most generous and courteous host throughout. Invitations were sent, several weeks in advance of the conference date, to the following participants:

Sr. Rafael Larco Herrera, Hacienda Chiclín
Dr. A. L. Kroeber, University of California
Dr. Julio C. Tello, Museo Nacional de Antropologia, Lima
Dr. Luis E. Valcarcel, Ministro de Educacion Publica
Sr. Rafael Larco Hoyle, Director, Museo Chiclín
Dr. W. D. Strong, Columbia University
Dr. Julian H. Steward, Columbia University
Dr. W. C. Bennett, Yale University
Dr. F. W. McBryde, Institute of Social Anthropology, Smithsonian Institution
Sr. Constante Larco Hoyle, Museo Chiclín
Sr. Javier Larco Hoyle, Museo Chiclín
Dr. Jorge C. Muelle, University of San Marcos
Sr. Junius Bird, American Museum of Natural History
Sr. James A. Ford, American Museum of Natural History
Sr. Donald Collier, Chicago Natural History Museum
Dr. Gordon R. Willey, Bureau of American Ethnology, Smithsonian Institution
Sr. Clifford Evans, Columbia University

On August 7 the members in attendance, Messers Bennett, Bird, Collier, Evans, Ford, Larco Herrera, R. Larco Hoyle, J. Larco Hoyle, McBryde, Strong, and Willey, unanimously elected Dr. A. L. Kroeber as President of the Conference in absentia, and a cablegram so informing him was ordered. Sr. Larco Herrera opened the conference with an address of welcome and briefly outlined the founding of the Chiclín Museum and some of its aims. Sr. R. Larco Hoyle offered continued collaboration with all scholars from scientific institutions both national and foreign. Dr. Strong, on behalf of the Virú group, briefly outlined the concept of the unified Virú Valley program, its instigation, and its prosecution to the present date.

Following this, the remainder of the day was devoted to a series of specific field reports by the individual members of the Virú Valley program. These were, *per force*, in the nature of preliminary reports since in all cases the actual work was still in progress, and final analysis pending. The brief résumés of these reports which are included here must always be judged as only preliminary, presented more for benefit of criticism and suggestions than as conclusive statements.

(1) *Pre-Ceramic Discoveries*, by Junius Bird

Working on the problems of isolating the remains of the early pre-ceramic populations of coastal Peru, Bird began work at the Huaca Prieta, El Brujo, Chicama rather than in the Virú Valley proper. Here a pre-ceramic culture was found, but surprisingly, one apparently agricultural in economy. Sea food and animal bones in the refuse deposits are insufficient to have supported the population, and direct evidence of gourd, squash, lucuma, and cotton are present. These early finds include percussion-flaked tools and, amazingly, bark-cloth. There is no true weaving, but twined textiles were found.

(2) *Post-Mochica Cultures in Virú*, by Donald Collier

The work, thus far, has demonstrated that a number of late sites, particularly Inca, existed in the lower part of the

valley. As Collier's excavations have only recently been initiated his analyses of materials from rubbish heaps in connection with these sites have not been begun although field observations lead him to expect stratigraphy working back from the Estero (Inca-influenced) period.

(3) *Surface Survey Sampling*, by James A. Ford

This survey was conducted by making adequate surface collections of potsherds from a great many sites in the Virú Valley and then, by classification and analyses, comparing these collections on a typological and percentage basis with materials from the stratigraphic cuts made by other members of the Virú program. From this, a great number of sites could be dated in terms of their range of occupation. In terms of the life graphs of several key pottery types, the survey thus far has indicated a sharp gap between the plain wares of the Guañape (Cupisnique) and Puerto Moorin (Salinar) periods and also a sharp shift or interruption, although no gap, between Huancaco (Mochica) and Tomaval (North Coast Tiahuanaco).

(4) *Settlement Patterns in Virú*, by Gordon R. Willey

The combined vertical cross-sectional studies and the period identification of sufficient survey sites make a study of settlement patterns possible. Such a study includes definition of physical community types throughout time and the relationships of these communities to environment and land utilization with ultimate implications as to population sizes and social and political organizations. Tentatively, the eight Virú periods—(a) Cerro Prieto (coastal pre-ceramic), (b) Guañape (Cupisnique), (c) Puerto Moorin (Salinar), (d) Gallinazo (Virú Negative), (e) Huancaco (Mochica), (f) Tomaval (North Coast Tiahuanaco), (g) La Plata (Chimu), and (h) Estero (Inca influence)—show the following trends through time:

Periods *a–b* represent small isolated populations with the probabilities suggesting only marginal horticulture. In periods *c–d* there is a rapid increase in valley population culminating in the virtual conquest of the valley by irrigation and horticulture. At this time, although there are many scattered dwelling sites, the first large politico-religious centers were constructed. Period *e* presents evidence of political conquest but not population replacement nor any great change in valley organization. Period *f* shows disruption and reversion with the breaking down of old agricultural organization and re-groupings in valley populations. The subsequent period *g* is local and secondary to extra-Virú centers, and *h* is the same but apparently under Inca political domination. Beginning with period *f* there is an interesting trend toward urbanization and the building of planned communities.

(5) *The Gallinazo Group*, by Wendell C. Bennett

Intensive work on this one large group, representative of the period of the same name, was directed toward obtaining as much information as possible on the remains and type of life characterizing this most intense period of Virú occupation. Sites of the group were shown to be of the following categories: pyramid and mound platform combinations; platform dwelling mounds; simple refuse mounds; and simple mounds with refuse and burials (probably not burial mounds in the strict sense). Excavation indicated that the total accumulation of the great pyramids and platforms is artificial. Superimposed building levels indicate at least three major subdivisions of the Gallinazo period. These subdivisions are characterized by a sequence in construction materials beginning with tapia and ball adobe, running through cane-marked rectangular adobes, and terminating with rectangular plain adobes. Ceramic analysis should show whether or not ceramic sequences parallel those of the building levels.

(6) *Stratigraphic Sequence in the Virú Valley*, by W. D. Strong

Stratigraphic work in refuse deposits, combined with grave excavations, at 5 sites in the Virú Valley served to establish a chronological yardstick against which the results of other units of the program, such as the survey or settlement pattern study, could be fitted. Two deep excavations of some 7 meters each gave detailed data on the transition from Puerto Moorin (Salinar) to Gallinazo (Virú Negative). A third site showed, for the first time, the important stratification of Huancaco (Mochica) over Gallinazo (Virú Negative). Excavations in still another site isolated Puerto Moorin (Salinar) burials and their accompanying grave lot materials, and two more deep cuts at a fifth site yielded evidence on the Cerro Prieto, a pre-ceramic culture similar to the one discovered later by Bird in the Chicama Valley, and Guañape (Cupisnique) occupations. In general the transition from Cerro Prieto to Guañape is still uncertain, and the vertical sequences also show the break, indicated by the survey, between Guañape and Puerto Moorin. The succession of cultures in the order named (Cerro Prieto, Guañape, Puerto Moorin, Gallinazo, and Huancaco) seems well established however.

In a chronological chart for Virú, Strong also presented the Virú sequence and gave names to the major prehistoric periods or epochs.

(7) *Geographic Aspects of Virú*, by F. Webster McBryde

Actual field work has only recently been initiated on this part of the project. A base map for the valley is being drawn from air mosaics to a scale of 1:25,000. This will show important physical features and will locate the 300 odd sites numbered and studied by the surveys. Further, the geographic study will provide data on present day land use and hydrographic features. A list of geographic terms for features of the Peruvian coast, and particularly Virú, is contemplated.

The second day of the conference, August 8, was devoted to a discussion of North Coast chronology and the major Epochs of Peruvian prehistory. Sr. R. Larco Hoyle led the discussion by presenting his correlation of the culture periods of the various North Coast valleys and by defining in some detail the cultural characteristics which characterize the several Epochs or broad time horizons of the North Coast and, probably, to all of the Peruvian culture area. The Epochs presented by Larco, and the period content of each, are, except for a few specific points, equitable with Strong's interpretation of the Virú Valley sequence.

The major Epochs and their diagnostic elements were offered by Larco as the following.

(a) Pre-Ceramic. An Epoch now being studied for the first time as a result of the work of Bird in the Chicama and Strong and Evans in the Virú Valleys. The Huaca Prieta and Cerro Prieto cultures belong on this level.

(b) Initial Ceramic. This Epoch is, theoretically, the time of the invention or introduction of the ceramic art to Peru. So far, the Epoch is essentially a blank, although the crude Queneto Temple pottery might be placed here.

(c) Formative. Basic inventions and development of technology characterize this Epoch. The increase in agriculture is marked. Incised ceramics, anthracite mirrors, conical and hemispherical adobes, abundance of stone and bone implements, and a great emphasis on the feline element in religious and artistic symbolization are noteworthy traits. The Puerto Moorin and Early Gallinazo cultures of the Virú Valley and the Salinar culture of the Chicama Valley are representative.

(d) Florescent or Auge. The Epoch marks the culmination of technological advance and the florescence in art styles. Outstanding traits are slipped, well-painted ceramics, rectangular adobes, pictorial art, large pyramids, advanced metallurgical techniques, developed social and political institutions, and ideographic writing. Late Gallinazo and Mochica are the Virú and Chicama culture periods which Larco places in this Epoch.

(e) Fusion. In this Epoch there are widespread invasions and resulting cultural fusions on a grand scale. Huari (Coast Tiahuanaco) is an influence which comes up from the south to introduce new art styles and a new religion. Lambayeque and Cajamarca influences are strong in ceramics. In Virú this is represented by the Tomaval period, in Chicama by the various periods of Huari, Lambayeque, and Cajamarca influence following after Mochica.

(f) Imperial. This Epoch sees the formation of large empires such as the Chimu and the Inca. Populations cluster in large city centers, and political domination of some groups is widespread.

(g) Colonial. An Epoch similar to the preceding one, only with the substitution of foreign invaders. The same process of conquest and amalgamation is, however, to be observed.

In the ensuing discussion, which followed this presentation, the question was raised as to whether the major Epochs were time periods of history, equally expressible from valley to valley in terms of year or century dates, or whether they were considered as stages of development in which contemporaneity or non-contemporaneity were purely fortuitous. In debate of this point it developed that while the Epochs were primarily horizontal levels in a time framework that the fact of proximity of ancient Peruvian culture centers to each other permitted rapid exchange, and development trends usually affected all centers at about the same time. Thus, Epochs, or time horizons, also seemed to correspond with general levels of culture development within the Peruvian intensive culture area. It was also made clear at this time that culture origins were not necessarily assumed to have taken place within the Peruvian area in spite of the long, traceable record of many traits.

The question was asked if the diagnostic traits of an Epoch would be useful in placing chronologically a newly isolated culture, or, in other words, could we work from the degree and kind of cultural development to infer historical position. While it was generally agreed that such an approach would give an interesting lead, ultimate confirmation of time position required stratigraphic or comparable evidence. In this same connection, it was pointed out that Inca culture, or the Imperial Epoch, possessed all of the traits listed for the Florescent Epoch. This was admitted, and it was seen that the definitive characteristics of the Imperial Epoch must be determined exclusive of those which had carried over from the earlier time period.

On the whole there was general agreement that Peruvian prehistory could be segregated into significant horizontal Epochs, of which the major ones would certainly conform closely to the seven outlined. Since calendars were lacking, there would always be some variation in the division of one Epoch from another, but even this would diminish as stratigraphic information for many regions became available. It was also agreed that the valid procedure for defining any horizontal historical Epoch was to determine the least common denominator for all cultures pertaining to that time period. Perhaps all diagnostics would not apply to every contemporaneous culture, due to factors of cultural lag, but by and large significant characteristics could be isolated.

(*G. R. W.*)

COMMITTEES APPOINTED BY THE PRESIDENT

In accord with Article VII of the Constitution, President Byers has appointed the following committees:

Budget Committee: Frederick Johnson, *Chairman*, and the Executive Committee.

Auditing Committee: Maurice Robbins, *Chairman*, Ripley P. Bullen, Benjamin L. Smith.

Nominating Committee: J. O. Brew, *Chairman*, Henry B. Collins, Jr., James B. Griffin.

Program Committee: Fay-Cooper Cole, *Chairman*, Glenn A. Black, John C. McGregor, George I. Quimby, Jr.

Committee on Local Arrangements: Volney H. Jones, *Chairman*, Emerson F. Greenman.

Membership Committee: Robert F. Heizer, *Chairman*, T. M. N. Lewis, Maurice Robbins, Dr. P. F. Titterington, E. B. Sayles.

Resolutions Committee: Carl E. Guthe, *Chairman*, William S. Webb, Gordon R. Willey.

Planning Committee: Frederick Johnson, *Chairman*, Emil W. Haury, James B. Griffin.

Committee to Consider Revision of the Constitution: Watson Smith, Frederick Johnson.

NOMINATIONS FOR NEW OFFICERS

Before the annual meeting the Nominating Committee will consider the names of persons to be nominated for the position of President, two Vice-Presidents, Treasurer, and two members of the Council. Members are invited to make any suggestions regarding the names of persons to fill these positions to Dr. J. O. Brew, Peabody Museum, Cambridge, 38, Massachusetts.

SOCIETY FOR AMERICAN ARCHAEOLOGY
ANNUAL MEETING—1946

The eleventh annual meeting of the Society for American Archaeology was held on May 17 and 18, 1946, at the Lincoln Hotel in Indianapolis, Indiana, in conjunction with that of the Central States Branch of the American Anthropological Association.

A meeting of the Executive Committee was held at 1:45 on May 17. Present were President Carl E. Guthe, Secretary Waldo R. Wedel, Treasurer Frederick Johnson, and Editor Douglas S. Byers. In accord with its previous action by mail, establishing the Pre-Columbian Fund as a fund of the Society and in conformity with the By-Laws, Article 2b, of the Fund, the Executive Committee instructed the Secretary to cast a unanimous ballot for the Board of Trustees of the Pre-Columbian Fund, as submitted by Kenneth MacGowan, Secretary of the Fund. The following Trustees were elected for the terms indicated:

Six-year term	*Four-year term*	*Two-year term*
Ralph L. Beals	Wendell C. Bennett	Fay Cooper-Cole
Alfonso Caso	Douglas S. Byers	Harold Gladwin
Gordon Ekholm	Frederick Johnson	Sylvanus G. Morley
Frederick W. Hodge	Alfred L. Kroeber	Cornelius Osgood
A. V. Kidder	Earl H. Morris	Matthew W. Stirling
J. A. Mason	Donald Scott	Doris Z. Stone
Alfred M. Tozzer	W. D. Strong	J. Eric Thompson

This action was subsequently presented to the annual meeting by the Secretary and was approved.

Following the meeting of the Executive Committee, a Council meeting was held. This was attended by the above named members of the Executive Committee, and Mr. Eli Lilly. The following motions were unanimously approved:

That the amended budget, including an increase of $140.00 in the Editor's account, be approved as submitted by the Budget Committee and presented to the annual meeting.

That the Treasurer be authorized to dispose of second-hand numbers of AMERICAN ANTIQUITY at the following rates: Vol. 1–8, $1.50 per volume, $.50 per number; Vol. 9 and subsequent issues at $2.00 per volume and $.60 per number.

That not more than 10 publication exchange agreements by the Treasurer with European organizations be authorized, subject to later adjustment by the Council.

The Council meeting adjourned shortly after 2 P.M.

The annual business meeting of the Society was called to order by President Guthe at 2:25 P.M., with approximately 40 members present.

The minutes of the tenth annual meeting in 1945 were not read, but were approved as published in AMERICAN ANTIQUITY, Vol. XI, No. 2, October, 1945.

REPORT OF THE SECRETARY

The tenth annual meeting of the Society for American Archaeology was held on Saturday, May 19, 1945, at the Cosmos Club in Washington, D. C. The minutes of the meeting were printed in AMERICAN ANTIQUITY, Vol. XI, No. 2 (October, 1945).

During the past year, 1945–46, President Carl E. Guthe appointed the following committees:

Budget Committee: F. Johnson, Chairman; Carl E. Guthe; W. R. Wedel; D. S. Byers; J. A. Mason; M. W. Stirling; J. G. McAllister.

Auditing Committee: Leaman F. Hallett, Chairman; J. O. Brew; R. P. Bullen.

Nominating Committee: F. H. H. Roberts, Jr., Chairman; W. C. McKern; W. D. Strong.

Program Committee: H. B. Collins, Jr.; W. R. Wedel; F. H. H. Roberts, Jr. (to replace G. R. Willey).

Membership Committee: Irving Rouse, Chairman; R. F. Heizer; T. M. N. Lewis; E. B. Sayles; P. F. Titterington.

Resolutions Committee: G. F. Ekholm, Chairman; J. A. Mason; W. R. Wedel.

At the annual meeting in 1945, the Society approved "in principle the proposition that it become the fiscal agent for the Pre-Columbian Fund"; and the Treasurer was authorized to draw up appropriate agreements and contracts with other persons concerned. Subsequently, the Executive Committee unanimously approved the proposed Constitution and By-Laws of the Pre-Columbian Fund, as well as a motion that the Society establish the Pre-Columbian Fund as a fund of the Society. This action is subject to review at the present annual meeting of the Society.

In November, the Executive Committee approved allocation of $900.00 as the Society's share of publication costs for Memoir No. 3.

In November, the Council set the time of the 1946 annual meeting as the week-end of May 18th, and accepted unanimously an invitation from Mr. Eli Lilly that Indianapolis be the meeting place, jointly with the Central States Branch, American Anthropological Association.

No regional or special meetings of the Society were authorized by the Executive Committee.

Respectfully submitted,
WALDO R. WEDEL, *Secretary*

The report of the Secretary was accepted.

REPORT OF THE EDITOR

During the year 1945–46 the Society published Volume XI of AMERICAN ANTIQUITY, amounting to 280 pages. Although the number of pages is not as great as that in Volume X, the last volume in the old format, which ran to 432 pages, the amount of material which was published is sufficient to make a volume of more than 500 pages under the old format.

From the Editor's point of view, the new format has been a great success because it has enabled the Society to publish more material with the funds available. It has been elastic to a degree never possible with the old format. This, in turn, has resulted in less waste space in each number.

From the reader's point of view, one must admit that the format has not been entirely successful in the sections of the journal devoted to reviews and communications. One more point leading will open these pages up and make them easier to read.

In the matter of paper we can look for no improvement for another two years. When the time comes when we can use 70-pound paper again, readers will no longer be bothered by printing which shows through from the other side of the page. The thickness of the issue may then be sufficiently great to permit a back strip, such as we used to have, and it may also be great enough to permit a return to sewn binding. Improvement in color of paper, especially noticeable if the July, 1945, issue is compared with that for April, 1946, is due to the ending of restrictions on the use of chlorine for bleaching.

In June, 1945, the Editor accepted for publication a manuscript entitled "The Prehistory of North America as seen from the Yukon" by Frederica de Laguna. Through a very generous contribution from a friend of the Society and another from The University Museum, our Publication Fund has been sufficiently augmented to permit publication of this important manuscript as Memoir Number 3. Although the manuscript has been in the printer's hands since early January, the shortage of skilled operators has made it impossible to start work on the volume. The printer hopes that type can be set during the fall, but there is no promise that the Memoir, which will make a book of over 300 pages with thirty pages of collotype plates, an index, and a glossary will appear with the January, 1947, issue of the journal. No other manuscript for a possible memoir has yet been submitted.

The file of manuscripts is now at its lowest. With the July number in press and the October number made up and ready to go to press, we have only one manuscript on hand. It is to be expected that more manuscripts will appear soon, but it is apparent that the Editor will have to continue to solicit manuscripts until such time as more appear.

In the field of Anthropology we are faced with a serious problem as far as publications are concerned. Naturally the supply of manuscripts has dwindled with the transfer of our energies to the prosecution of the war. At the same time, a new anthropological journal has been launched, and this will naturally divert some manuscripts which AMERICAN ANTIQUITY might have published. Some of our state archaeological societies are publishing bulletins of considerable interest; but here, again, they divert manuscripts which might have appeared in AMERICAN ANTIQUITY. Thus we find that there is increasing competition at the present time. The *American Anthropologist*, formerly accepting articles primarily of ethnological import, now actively solicits archaeological manuscripts.

In order to fill its pages, your Editor has been forced to accept manuscripts for AMERICAN ANTIQUITY which might better have appeared in other journals.

It appears that we will soon be faced with a serious problem of keeping abreast of literature in the anthropological field. Even at the present time one must subscribe to three journals in order to know what is being published in the field of archaeology, and if one wishes to be thoroughly informed one should also join a number of state societies in order to catch the important articles which appear in some journals.

It has been suggested that AMERICAN ANTIQUITY confine its interest to factual articles, leaving theoretical articles for our sister journal, the *American Anthropologist*. This, I believe, would not be fair to the membership of the Society which includes many persons who are not members of the American Anthropological Association. Many who are not practicing anthropologists are included in our membership. They are intensely interested in articles of general scope, including theoretical and interpretive material. I believe that in all fairness to them that we should not confine AMERICAN ANTIQUITY to factual articles which all too frequently are highly specialized and of interest chiefly to persons who are concerned with excavation and research in the problem under discussion.

In the course of the reorganization of the Anthropological field which is now under consideration it is conceivable that some solution to this problem may be worked out.

Another problem which the editor faces is that of securing adequate and competent help in the technical preparation of the journal. The editor is faced with a job that demands a considerable portion of his time. If he cannot get help he will be so loaded with work that either the journal or his own work will suffer. Most persons will naturally be expected to devote the greater part of their time to the institution which pays their salaries. In finding a competent person to take over the editorship, the present lack of assistance has been a very definite handicap.

With our membership at its present figure, AMERICAN ANTIQUITY is now at its ceiling. It does not seem wise to discontinue the practice of publishing memoirs, yet we have no funds with which to expand the journal much above its present size. During the current year we have exceeded the budget, but this is largely the result of accepting too many illustrated articles and of issuing an eighty-page number in October. AMERICAN ANTIQUITY cannot expand until the membership in the Society is increased.

In submitting this, my final report as Editor of the Society, I wish to take occasion to thank the Treasurer and the Secretary for their cooperation, kindness, and forebearance and to express to the Associate Editor and the Assistant Editors my sincere appreciation of their interest and labors in behalf of the success of the journal. It has been a real privilege to have served as Editor of this Society. May I wish all success to the new Editor and urge that the membership accord him the same splendid cooperation which I have received.

Respectfully submitted,
DOUGLAS S. BYERS, *Editor*

The report of the Editor was accepted.

W. C. McKern presented the report of the Nominating Committee, containing the following slate for officers:

President:	Douglas S. Byers
First Vice-president:	J. O. Brew
Second Vice-president:	Daniel F. Rubin de la Borbolla
Secretary:	Waldo R. Wedel
Treasurer:	Frederick Johnson
Editor:	Irving Rouse

Members of the Council:
John C. McGregor (1946–47, to serve out Brew's term)
John L. Champe (1946–50)
Robert F. Heizer (1946–50)

There being no nominations from the floor, the Secretary was instructed to cast a unanimous ballot for the official slate, and the officers were thereupon declared elected.

The following resolutions were presented by the Committee on Resolutions (Ekholm, *Chairman*, Mason, Wedel), and were unanimously adopted:

1) *Be it resolved*, That the Society for American Archaeology express its deep appreciation to Eli Lilly, Paul Weer, and Glenn Black for their untiring efforts which have made possible the meeting in Indianapolis.

2) *Be it resolved*, That the Society for American Archaeology gratefully acknowledge the services of its retiring Editor, Mr. Douglas Byers, during the past seven years.

3) *Be it resolved*, That the Society for American Archaeology express its appreciation to Mrs. Clifford A. Drew, former Assistant to the Treasurer, for her efficient discharge of the duties of that office.

4) *Be it resolved*, That the Society for American Archaeology express its deep sense of loss in the deaths of the following members: Father Conrad Bilgery, William North Duane, Charles V. Fuller, William J. Howes, Theodore H. Sherman, and Alfred R. Shurrocks.

REPORT OF THE TREASURER

ACCOUNT OF MEMBERSHIP

Changes in membership during fiscal year 1945–46

	Active	Institutional	Life	Benefactor and Honorary
5/1/45	612	141	11	0
New and reinstated	88	10	2	
Dropped	35			
Deceased	4		1	
4/30/46	661	151	12	0
Type of Account				
Fiscal	621	85		
Fiscal prepaid	39	5		
Calendar year	1	61		
Exchange and complimentary		15		

SOCIETY FOR AMERICAN ARCHAEOLOGY

BALANCE SHEET

Resources

Cash in checking a/c—General operating balance, see pp. 2&3		$1,604.11
Publication Fund Savings a/c see p. 4		3,714.44
Dues Receivable	$ 22.00	
Miscellaneous accounts receivable	130.57	
		152.57
Total general operating assets		$5,471.12
Cash in checking a/c—Planning Committee		972.19
Permanent Fund (Life Membership) savings a/c, see p. 4		761.49
		$7,204.80

Liabilities and Capital

Dues Prepaid		$ 403.50	
Estimated Bills Payable		2,956.08*	
Total Liabilities			$3,359.58
Restricted Capital			
Planning Committee	$972.19		
Permanent Fund	761.49		
		$1,733.68	
Free Capital		2,111.54	3,845.22
			$7,204.80

*Estimated cost of publishing AMERICAN ANTIQUITY, Vol. XI, No. 4	$ 650.00
Estimated cost for completion of publication of Memoir 33	2,206.08
Estimated Annual Meeting Expense	100.00
	$2,956.08

Operating Statement

Receipts

Beginning Balance Forward 5/1/45		$2,148.90
Cash receivable		
Dues and Subscriptions		
Prior years	$ 47.00	
1945–46	2,918.60	
Prepaid	292.00	
	$3,257.60	
Contributions	550.00	
Sale of American Antiquity	410.11	
Receipts for Reprints	304.13	
Receipts for Illustrations	209.57	
Sundry		
Rec'd from bank coll. charges	$ .45	
Overpayments bills due	18.42	
Rec'd. for transfer to Life Membership	137.00	
Memoir #2, Rec'd. from L.S.U.	215.55	
Planning Committee		
Rec'd. from A.C.L.S.	75.00	
Rec'd from Viking Fund	1,000.00	
Refunds	36.12	
	$1,482.54	
Total Cash Received		$6,213.95
Total receipts		$8,362.85

Expenditures

Publishing American Antiquity		
Printing	$2,146.98	
Illustrations	705.13	
Distribution	84.30	
Reprints	349.36	
	$3,285.77	
Editor's Account	325.32	
Treasurer's Account	290.61	
Sundry		
Annual Meeting 1945	$ 42.48	
Affiliation dues I.S.A. & G.	3.00	
Transfer to Publication Fund (Contributions received)	550.00	
Transfer to Publication Fund (Appropriation)	500.00	
Transfer to Permanent Fund	137.00	
Refunds, overpayment of bills	23.00	
Miscellaneous	7.59	
Planning Committee expenses	587.10	
Annual Bills for 1946	21.65	
Annual Meeting 1946	13.03	
	$1,884.85	
Total cash paid		$5,786.53
Total cash on hand 4/30/46		$2,576.30
Planning Committee Balance	$ 972.19	
General operating balance	1,604.11	
	$2,576.30	

Permanent Fund

4/30/45 Brought Forward	$ 611.14
10/15/45 & 4/15/46 Interest	13.35
7/6/45 Garland J. Marrs—Life Member	71.00
4/23/46 Mrs. William H. Campbell—Life Member	66.00
4/30/46 Balance	$ 761.40

Publication Fund

4/30/45 Brought Forward	$ 724.69
Contributions during fiscal year	3,050.00
4/30/46 Transfer from Working Fund (Appropriation)	500.00
10/15/45 & 4/15/46 Interest	33.67
Total Income	$4,308.36
Meriden Gravure Co. a/c Memoir #3	593.92
4/30/46 Balance	$3,714.44

Respectfully submitted,
Frederick Johnson, *Treasurer*

The report of the Treasurer was accepted, subject to the report of the Auditing Committee

Report of the Auditing Committee

The undersigned, appointed as the Auditing Committee, report that they have examined the Treasurer's Accounts, as submitted for the fiscal year 1944, and find them correct.

Leaman F. Hallett, *Chairman*
Ripley P. Bullen

Report of the Budget Committee

On behalf of the Budget Committee, Mr. Johnson presented the budget of expenditures for the year 1946–47.

The amended budget for 1946–47, including an increase of $140.00 in the Editor's account, was accepted. A motion that the budget be published as part of the minutes of the meeting was seconded and then approved without dissent.

Budget 1946–47

Estimate of Income

Estimate Balance Forward			$1,984.81
Estimated Income from Dues & Subscriptions			
Present Active Membership	651		
Estimated net loss	8		
Estimated total	643		
Present instit. members	150		
Estimated paying membership	793		
Prepaid dues brought forward			
29 members at $4.00		$116.00	
Irregular payments		5.91	
52 ½ year payments		104.00	
1 ½ year (cal.) 1947		2.00	
Total prepaid dues		$ 227.91	
1946 dues—711 at $4.00		2,344.00	
Total Estimated Income from Dues & Subscriptions			3,071.91
Contributions			200.00
Sale of American Antiquity			200.00
Transferred from Publication Fund a/c Memoir #3			2,800.00
Transferred from Publication Fund a/c Memoir #4			600.00
Total Estimated Income			$8,856.72

Estimate of Expense

Publishing American Antiquity			
Vol. XI, No. 4—net cost		$ 650.00	
Vol. XII		2,600.00	
Publishing Memoir #3		2,800.00	
Publishing Memoir #4		600.00	
Editor's Account			
Assistant ($50.00 per quarter)	$200.00		
Secretary	200.00		
Postage, Telephone, supplies	40.00		
Moving Editor's office	50.00		
		$ 490.00	

Treasurer's Account			
Secretary ($10.00 per month)	$120.00		
Printing & Mimeographing	60.00		
Bank & Collection Charges	20.00		
Postage, Telephone, Supplies	50.00		
		$ 250.00	
Miscellaneous Expense			
Secretary's office	60.00		
President's office	15.00		
Incidentals	50.00		
Annual Meeting	150.00		
		$ 275.00	
Planning Committee Expenses		630.75	
Transfer to Publication Fund		500.00	
Total Estimated Expenses			$8,795.75
Free Cash			60.97

REPORT OF THE PLANNING COMMITTEE

During the past year the activities of the Planning Committee have been hampered by the scarcity of labor. It has been possible to complete the first phase of the compilation of a finding list for the archaeologica work done under W.P.A. Paul Cooper spent some two weeks in Washington, for the Committee, finishing up work on the data deposited in the United States Museum. The tables he made are now ready to be organized and sent out for correction and amendment. It is hoped that this can be done and the final report completed during the next year.

FREDERICK JOHNSON, *Chairman*
JAMES B. GRIFFIN
EMIL W. HAURY

The report of the Planning Committee was accepted as read.

An interim report of the Committee for Recovery of Archaeological remains was presented by Mr. F. Johnson, Secretary of the Committee and also the Society's representative thereon. The report was accepted unanimously after some discussion from the floor.

REPORT OF THE MEMBERSHIP COMMITTEE

The report of the Membership Committee was presented by Mr. Irving Rouse, Chairman. After some discussion, the report with the recommendations of the Committee, were accepted and ordered to be included in the minutes of the meeting:

At the annual meeting in Washington last spring there was considerable discussion of the advisability of increasing the membership of the Society in order to meet the increased costs of publication. This discussion was continued by mail after the meeting, with the result that in the fall the President appointed a committee on membership consisting of Heizer, Lewis, Sayles, and Titterington, with the writer as chairman.

The primary purpose of this committee has been to explore the means of increasing the membership of the Society. In addition, we have received several suggestions for revising the rules for membership. We have discussed these matters by mail and, without coming to any definite conclusions, have prepared several recommendations for the consideration of the Society.

The committee is agreed that the Society might well undertake a membership campaign. It is proposed that invitations to membership be prepared. Some of these might be distributed, together with application blanks, among the members of the Society for their use in attracting non-members to join. Others would be sent to the various local archaeological societies for distribution among their members. Still others might be used in the universities to help bring more students into the Society. Finally, it would be possible to obtain lists of those interested in archaeology in each area and to circularize them about joining the Society.

In connection with the proposed membership campaign, several suggestions have been made for increasing the attractiveness of the Society to non-members. Some of these will be familiar to those who attended the last meeting; for example, it has been suggested that the language of the articles in AMERICAN ANTIQUITY be simplified in order to make them more readable. The introduction of a glossary has also been proposed for the same reason. One member of the committee went so far as to recommend that the Society issue two series of publications, one technical and the other non-technical.

It had been suggested that the proposed membership campaign might also be furthered by establishing closer relationships between the Society for American Archaeology and the various local archeological societies, for example, by appointing representatives of the national society in the local ones. The majority of the committee did not take kindly to this suggestion, however, and it seemed best only to approach the local societies in connection with the proposed invitations to membership.

The secretary, Dr. Wedel, has called to the attention of the committee the provision of the constitution requiring prospective members to obtain the indorsement of two persons already enrolled as members of the Society. This has caused a certain amount of difficulty, since many applicants are not personally known to members. The committee is in favor of abandoning this provision, although it has also been suggested that the Society might well reserve the right to refuse membership to commercial diggers and other undesirables.

The treasurer, Mr. Johnson, has also brought up the advisability of revising the qualifications for Life Membership. Since this proposal came too late to be discussed by the committee, it seems best simply to quote Johnson's remarks:

"The constitution states in Section 7, 'Any active Member may become a Life Member by the payment at one time of seventy-five dollars, less half the total amount already paid by him in annual dues.'

"During each year I have one or two applications for Life Membership. This year there were two; one paid $71.00 and the other paid $66.00. In each case this was more than was necessary but the additional was contributed when I pointed out to the prospective members that the Society loses money on Life Memberships. Instead of contributing they could have objected and hauled me over the coals for being rude.

"In the eyes of the Treasurer, the cost of Life Membership is much too small. We have now 12 Life Members, most of whom came in under the old rate; $55.00 I think it was. Anyhow, the income from the Permanent Fund, which is composed of payments for Life Membership is, this year, $13.35. For this sum the Society distributes $48.00 worth of magazines. That is, AMERICAN ANTIQUITY and the publications of the Society are distributed at cost. By the time we get through running the Society which makes publication possible the $4.00 per year is pretty well used up.

"Anybody with an eye to economy and the hope he will live for a few years is a chump not to become a Life Member. I do not expect any great rush as such is not usual. However, I do not think we should afford the luxury of Life Members. The Fund is not very useful. The income is not sufficient to pay for what they cost us.

"My suggestion is that the Life Membership be raised to something like $250.00 and that there be no discounts for previous membership. To do such a thing necessitates an amendment to the Constitution. This cannot be done this year but it would be a good idea to get this going now so that proper notice and what not could be sent out before the next meeting."

Respectfully submitted,
IRVING ROUSE

Mr. Frederick Johnson briefly reviewed the previous actions of the Society in connection with the Pre-Columbian Fund, as well as the action of the Executive Committee in establishing the Pre-Columbian Fund as a Fund of the Society. The motion was then made, seconded, and unanimously adopted that the Society approve the action of the Executive Committee in its vote to establish the Pre-Columbian Fund as a Fund of the Society for American Archaeology in accordance with the Constitution and By-Laws which were submitted. The Secretary was ordered to file with the minutes of this meeting a copy of the Constitution and By-Laws of the said Pre-Columbian Fund in the form presented to the Executive Committee.

THE PRE-COLUMBIAN FUND

Constitution

Organization and Purposes

In order to meet certain specific needs in the field of American archaeology the Pre-Columbian Fund is hereby established by the Society for American Archaeology. The purposes and aims of the Pre-Columbian Fund are: (1) to further the purposes of the Society for American Archaeology, as expressed in its constitution, by the stimulation of writ-

ing and the promotion of publication in order to accomplish the more rapid and complete dissemination of knowledge concerning all aspects of the prehistory of the New World; (2) to make grants-in-aid for scholars, field workers, and institutions, such as will enable them to engage necessary technical assistance and thus complete papers or other approved projects more thoroughly and expeditiously; (3) to establish and support writing fellowships for professional workers or established lay writers to enable them to complete research and writing in connection with a book or paper on an approved topic, or to make translations of similarly approved material; (4) to provide subsidies for learned journals; (5) to provide subsidies to learned societies and institutions for the publication of professional and technical monographs in the field of the Fund's interests; and to promote the publication of books of general interest in this field through normal commercial channels.

Powers

The Pre-Columbian Fund shall have the power to acquire, hold, solicit, administer, and disburse subventions or other income which it may receive; to acquire, hold, and convey property, real and personal; and to engage in such other activities as are necessary for the advancement of its interests.

Officers

The Pre-Columbian Fund shall be administered by the following officers; a Board of Trustees, an Editorial Board, a Secretary, and a Treasurer, whose election, duties, and terms of office shall be controlled by the By-laws governing the operation of the Fund.

Amendment

Amendment of this constitution may be made by the Board of Trustees with the approval of the Society for American Archaeology. A proposal for amendment shall be signed by five officers of the Pre-Columbian Fund and submitted to the Board of Trustees for action. When such a proposal shall be accepted by a majority vote, or by a writing signed by such majority, of the Board of Trustees it shall be submitted to the Society for American Archaeology and become effective when approved by the Society at a duly called and held meeting thereof.

By-Laws

Article 1—Administrative Boards and Officers

Section 1. The Board of Trustees shall consist of twenty-one elected members. At least two-thirds of these shall be members of the Society for American Archaeology. The following shall be ex-officio members of the Board of Trustees (in addition to the twenty-one elected members) and shall vote on all questions: the Secretary of the Fund, the Treasurer of the Fund, the Editor of the American Anthropological Association, the Editor of the Society for American Archaeology, the Editor of the Inter-American Society for Anthropology and Geography, the Editor of the Sociedad Mexicana de Antropologia, and the Editor of a South American Journal receiving subsidy.

Section 2. There shall be a Chairman of the Board of Trustees who shall serve for two years. The Chairman will serve until his successor takes office.

Section 3. The Editorial Board shall consist of five members, chosen insofar as possible to represent the various aspects of the field of American prehistory.

Section 4. The Treasurer of the Fund shall be the Treasurer of the Society for American Archaeology except that upon approval by the Society for American Archaeology of a petition by the Board of Trustees of the Fund any member of the Society may be elected Treasurer by majority vote of the Board.

Section 5. The Secretary of the Fund shall be elected by majority vote of the Board of Trustees.

Article 2—Election, etc.

Section 1. a. Seven members of the Board of Trustees shall be elected every two years to serve for a term of six years.

b. Procedure. A list of nominations for election to the Board shall be composed of members retiring plus seven additional nominees chosen in the following manner: Each member of the Board shall nominate seven persons not on the Board; the seven persons with the highest number of votes, including those tied for seventh place, shall be added to the names of the retiring Board members to form a nomination list of at least fourteen to be voted upon. The Board of Trustees shall elect by majority ballot seven members from this nomination list. The members shall take office upon being confirmed by vote of the Executive Committee of the Society for American Archaeology.

The first Board of Trustees shall be elected by the Executive Committee of the Society from a list supplied by the Acting Secretary of the Fund, Kenneth MacGowan, as follows: seven members for a six year term, seven for a four year term, and seven for a two year term.

Section 2. The Board of Trustees shall elect by majority ballot a Chairman who will serve a term of two years. No person shall serve more than two consecutive terms.

Section 3. A member of the Editorial Board shall be elected annually by the Trustees to serve a term of five years. The Trustees shall designate the Chairman of the Editorial Board who may not serve more than three years.

The member of the Editorial Board shall be elected from a list of nominees presented by the Board of Trustees.

The following persons shall constitute the original Editorial Board: Ralph Beals (5 years), Wendell C. Bennett (4) years, Alfonso Caso (3 years), Emil W. Haury (2 years), Wm. Duncan Strong (1 year).

Section 4. If the Treasurer of the Fund is the Treasurer of the Society for American Archaeology his term of office shall run concurrently with his term in the Society for American Archaeology. If the Treasurer of the Fund is elected by the Board of Trustees, his term of office shall be six years.

Section 5. The Secretary of the Fund shall be elected by the Board of Trustees to serve a term of six years. Nominees for Secretary shall be made by the members of the Board of Trustees, each member nominating two candidates and voting for one of the two receiving the highest number of nominating votes, including all candidates who may be tied for second place.

Kenneth MacGowan shall serve as Secretary for a term of six years beginning with the first regular election of members of the Board of Trustees.

Article 3—Duties of the Board of Trustees

Section 1. The Trustees shall decide by majority ballot questions of general policy; elect the officers, and otherwise pass upon questions which come before the Board.

Section 2. The Board of Trustees may at any time accept resignations of any officer or members of any board of the Fund and it may elect a person to fill the vacancy so created. The Board may, for just causes, and with the consent of the Society for American Archaeology, remove from office any officer of the Fund or a member of any board or committee.

Section 3. The Trustees shall pass upon a yearly budget made by the Treasurer and approved by the Editorial Board.

Article 4—Duties of the Treasurer

Section 1. The Treasurer of the Fund shall be responsible only to the Board of Trustees.

Section 2. The Treasurer shall administer and expend the monies of the Fund, subject to budgetary and other regulations approved by the Trustees and to the provision of Article 6 below.

Section 3. The Treasurer shall submit an annual report to the Board of Trustees, and, upon its approval, cause it to be incorporated in the published annual report of the Society for American Archaeology. The Treasurer's report shall be subject to such audit as the Trustees shall from time to time determine.

Section 4. The Treasurer may be required to give bond, the expense of which shall be borne by the Fund. He may, subject to authorization by the Trustees, employ clerical assistance.

Article 5—Duties of the Secretary

Section 1. The Secretary of the Fund shall act as Secretary of the Board of Trustees and of the Editorial Board, shall keep records of their deliberations and decisions, and shall see that the work of the Editorial Board is facilitated.

Section 2. The Secretary shall submit an annual report to the Board of Trustees, and, upon its approval, cause it to be incorporated in the published annual report of the Society for American Archaeology.

Section 3. The Secretary shall supervise elections of the officers, Trustees, and members of the Editorial Board.

Article 6—Finances

Section 1. Monies of the Fund shall be transferred to the Society for American Archaeology and shall be established and accounted for on the books thereof as the Pre-Columbian Fund.
Section 2. The Treasurer of the Fund shall disburse money upon authorization by the Board of Trustees or the Editorial Board.
Section 3. The Fund may expend either monies granted to it for immediate disbursement, or the income on capital funds if such are provided.

Article 7—Procedure, etc.

Section 1. The business of the Pre-Columbian Fund is to be conducted by correspondence. No money shall be expended for meetings of either board unless such money shall have been made available by special grant from an institution or individual. A meeting of either Board may be held, however, at the annual meeting of the Society for American Archaeology, if a majority of the Editorial Board or a third of the Board of Trustees is present and provided that all members of either or both Boards are previously notified.
Section 2. Any item of business may be initiated by any member of either Board and transmitted to the Secretary. The Secretary shall then communicate with each member of the appropriate board. Replies received shall be counted as votes. If no reply is received within three weeks, the member addressed will be considered to be not voting. A majority of the Editorial Board and one-third of the Trustees shall constitute quorums of the respective boards. In case of a tie vote in either Board, the vote of the Chairman shall be final.
Section 3. Applications for aid of any form may be submitted to any member of the Board of Trustees, or the Editorial Board, or the Secretary. Applications shall finally be transmitted to the Secretary who shall distribute them to the Editorial Board. After full investigation either by the Secretary or by members of the Board, or by both, the members shall vote to accept or reject the application. Acceptance of an application shall be made subject to budgetary limitations.
Section 4. Subsidies to learned journals may be granted only if such will tend to increase publication in the field of American prehistory. Such subsidies shall be allotted according to the number and cost of pages added over the average concerned with American prehistory in the years 1940-45. To the total cost of these additional pages should be added a reasonable amount for increases in overhead and distribution costs.
Section 5. Subsidies to aid in the publication of memoirs of monographs may constitute the whole or a part of the cost of the publication. Grants covering part of the cost of publication shall not be awarded until the remainder necessary for publication is guaranteed.
Section 6. Grants-in-aid may be made to individuals directly or through institutions.
Section 7. Neither the Board of Trustees nor the Editorial Board may grant sums over and above the total budgeted or available during a fiscal year.

Article 8—Duties of the Editorial Board

Section 1. It shall be the duty of the Editorial Board to solicit, receive and accept or reject applications for aid.
Section 2. The Editorial Board or the Board of Trustees may authorize the Treasurer to disburse money granted to applicants.
Section 3. The Editorial Board shall compose, and upon approval by the Board of Trustees, cause to be published in some convenient form a set of regulations. These shall clearly state the requirements which must be met by all applicants for aid. The minimum requirements include: the submission of a preliminary outline of the projected work and a brief discussion of the significance of the problem which the applicant intends to study; reasonable assurance of the completion of the project within a reasonable length of time; a detailed budget of the manner in which the sum applied for will be spent; reasonable assurance of the authority and accuracy of all work. Such regulations may be modified or amended at any time with the approval of the Board of Trustees.
Section 4. The Editorial Board may recognize unusual or emergency circumstances in regard to applications. In such cases, the Editorial Board may request the Board of Trustees to set aside limiting budgetary categories in order that an urgently needed sum may be assembled to form a particular grant to an applicant. Except under most unusual circumstances only unexpended surpluses may be thus transferred from one budgetary category to another.

Article 9—Amendments

Section 1. Amendments to these by-laws may be proposed by five members of the Board of Trustees. Amendments shall become effective upon a favorable vote of a majority of the Board of Trustees and the approval of the Executive Committee of the Society for American Archaeology.

A vote of appreciation was extended to Mr. Johnson for his unstinting and efficient activities during the year in connection with various fiscal and committee matters in which the Society was concerned.

The annual business meeting was adjourned at 4:45 P.M.

The Friday morning session, with President Guthe presiding, was devoted to a series of seven papers on archaeological subjects; approximately 60 persons were present. An informal banquet, attended by members of the Society as well as by the Central States Branch, was held at 6:30 Friday evening, with 76 persons present. Following the banquet, the retiring president addressed the gathering briefly. The evening was given over to an informal discussion of various aspects of the proposed reorganization of anthropology. No official action was taken in this connection.

The Saturday morning session was a joint session with the Central States Branch, presided over by Fred Eggan. Three papers on archaeology were presented. The remainder of the morning and the afternoon were given over entirely to a series of nine papers on non-archaeological subjects. A list of the papers concerned with archaeology is appended.

FRIDAY MORNING SESSION

David Baerreis, Culture Sequence in Northeastern Oklahoma. *Illustrated.*
Kenneth G. Orr, Culture Sequence at the Spiro Mounds, Le Flore County Oklahoma. *Illustrated.*
Alex D. Krieger, The Eastward Extension of Puebloan Datings toward the Mississippi Valley. *Illustrated.*
Lynn E. Howard, Preliminary Report on the Grant Focus, Garvin County, Oklahoma.
Waldo R. Wedel, Culture Chronology in the Central Great Plains. *Illustrated.*
Charles R. Keyes, Some Asides on the Iowa Archaeological Survey.
C. H. Webb, Archaic Cultures in Louisiana.

SATURDAY MORNING SESSION

Georg K. Neumann, Remnants of early American Indian Types in the Eastern United States. *Illustrated.*
Robert H. Merrill, A Graphical Approach to some Problems in Maya Astronomy. *Illustrated.*
Irving Rouse, Culture Areas in the Greater Antilles. *Illustrated.*

WALDO R. WEDEL, *Secretary*

May 27, 1946

MEMOIRS

of the

SOCIETY FOR AMERICAN ARCHAEOLOGY

The following numbers, may be obtained from the Treasurer, Frederick Johnson:

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1936 *Pleistocene Man in Minnesota.* University of Minnesota Press.

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